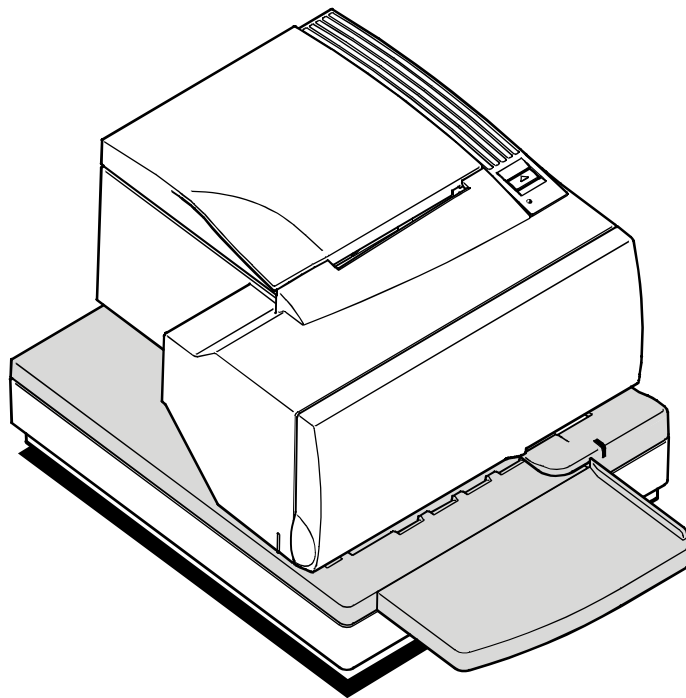A758 Thermal Receipt and
Impact Slip Printer

# Owner's Guide

**Axiohm** ™

# Legal Notices

**Disclaimer**

Information in this document is subject to change without notice. Consult your Axiohm sales representative for information that is applicable and current. Axiohm reserves the right to improve products as new technology, components, software, and firmware become available.

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**Trademarks**

AXIOHM is a trademark. Other trademarks and registered trademarks are the property of their respective holders.

**Federal Communications Commission (FCC)**
**Radio Frequency Interference Statement**

**Warning**

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**Note**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**Information to the User**

This equipment must be installed and used in strict accordance with the manufacturer's instructions. However, there is no guarantee that interference to radio communications will not occur in a particular commercial installation. If this equipment does cause interference, which can be determined by turning the equipment off and on, the user is encouraged to contact Axiohm immediately.

Axiohm is not responsible for any radio or television interference caused by unauthorized modification of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Axiohm. The correction of interferences caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

In order to ensure compliance with the Product Safety, FCC and CE marking requirements, you must use the power supply, power cord, and interface cable which is sold for use with this product or which meets the following parameters:

**Power Supply**
UL Listed (QQGQ), Class 2 power supply with SELV (Secondary Extra Low Voltage), non-energy hazard output, limited energy source, input rated 100-240 Vac, 1.5/0.8 A, 50/60 Hz, output rated 24 Vdc, 2.3 A.

Use of this product with a power supply other than the Axiohm power supply will require you to test the power supply and Axiohm printer for FCC and CE mark certification.

**Communication Interface Cable**
A shielded (360-degree) interface cable must be used with this product. The shield must be connected to the frame or earth ground connection or earth ground reference at EACH end of the cable.

Use of a cable other than described here will require that you test the cable with the Axiohm printer and your system for FCC and CE mark certification.

**Power Cord**
A UL listed, detachable power cord must be used. For applications where the power supply module may be mounted on the floor, a power cord with Type SJT marking must be used. For applications outside the US, power cords that meet the particular country's certification and application requirements should be used.

Use of a power cord other than described here may result in a violation of safety certifications that are in force in the country of use.

**Industry Canada (IC)**
**Radio Frequency Interference Statement**
This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

*Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.*

**Voluntary Control Council for Interference (VCCI)**
**Radio Frequency Interference Statement**

> この装置は，情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

# Contents

# Chapter 1: About the Printer

- ♦ **Introducing the A758 Printer**

- ♦ **Standard Features**

- ♦ **Options**

- ♦ **Model Identification Key**

# Introducing the A758 Printer

The A758 is an extremely fast, quiet, and reliable point-of-sale printer. It consists of two specialized printers in one compact package: a thermal printer on top that prints receipts, and an impact slip printer in front to print on forms and checks that you insert. The thermal printer is optimized for ease-of-use in busy environments. There is no ribbon or ink cartridge to change, and you load the paper by simply dropping in a new roll. The impact printer provides the power and flexibility necessary to print on checks or multi-part forms up to five plies, in a wide variety of sizes and orientations.

The A758 easily fits in anywhere. It connects to any host computer that uses the standard RS-232C interface. Other interfaces are also available. The printer's standard command set allows it to work with software written for Axiohm, or other ESC/POS™ compliant printers. A variety of sensors enable the printer to communicate its status, and the printer's journal is kept electronically by the host computer.

Several state-of-the-art check-handling options are also available. The Magnetic Ink Character Recognition (MICR) option enables the printer to read the special codes printed on checks and send this information to the host computer to verify the check. The Check Flip option saves transaction time by making check handling a one-step process—after reading the front of the check and printing on the back, the printer is able to flip the check over and print on the front of the check.

This section describes the printer's features and options in more detail.

# Standard Features

## Connectivity Features

♦ Industry standard RS-232C interface for communication with the host computer; other interfaces are available as options.

♦ Cash drawer kickout connector and software support for up to two cash drawers.

## Advanced Interface Design

♦ Sensors detect whether any of the covers are open, the paper is low in the receipt printer, or the paper is positioned properly in the slip printer.

♦ Software-controlled audible tone for various alerts.

♦ Online Configuration Menu—the printer guides the user through its configuration settings by printing instructions and a menu on receipt paper.

## Electronics and Firmware

♦ Industry-standard command set makes the printer compatible with existing software, yet enables new features.

♦ Remote diagnostics capability tracks important printer data.

♦ 512K flash memory with 192K available for multiple logos, graphics, user-defined character set, and user data storage. The printer is also available with 1 MB or 2 MB flash memory for additional user memory.

♦ 16-bit electronics architecture.

♦ Communication rate up to 115,200 baud.

♦ Flash download mode lets the user upgrade the printer's firmware.

## Thermal Receipt Printer

- ♦ Extremely fast and quiet thermal printhead.

- ♦ No ribbon or ink cartridge to change.

- ♦ Drop-in paper loading.

- ♦ Double high, double wide, bold, inverse, underlined, superscript and subscript, italics, scalable and rotated print modes.

- ♦ Resident character sets: Code Pages 437 (US), 850 (Multilingual), 852 (Slavic), 858 (with Euro symbol), 860 (Portuguese), 863 (French-Canadian), and 865 (Nordic) and 866 (Cyrillic).

- ♦ Prints standard bar codes: Code 39, UPC-A, UPC-E, JAN8 (EAN), JAN13 (EAN), Interleaved 2 of 5, Codabar, Code 93, Code 128, and PDF-417 two-dimensional code. Also prints "ladder" bar codes.

- ♦ Host-selectable 44 or 56 columns on 80 mm wide "POS grade" thermal paper.

- ♦ 8 dots/mm print resolution.

- ♦ Up to 130 mm/second print speed.

- ♦ Optional receipt cutter.

## Impact Slip Printer

- ♦ Bi-directional impact printhead designed for a very long life.

- ♦ Snap-on ribbon cassette.

- ♦ Prints on forms up to five plies.

- ♦ Horizontal flatbed slip table with an optional extension (which is standard with the MICR check reader option).

- ♦ Form insertion flexibility: insert forms in front or from the side.

- ♦ Form alignment sensors and LED indicator.

- ♦ Double wide and rotated print modes; a double strike print mode improves contrast.

- ♦ Software selectable pitch: either standard (13.9 characters per inch, 66 columns) or compressed (17.1 characters per inch, 80 columns).

- ♦ 290 lines-per-minute print speed.

- ♦ Optional check handling features (see "Impact Slip Printer Options" on next page).

# Options

## Connectivity Options

♦ A standard plug-in printed circuit board allows the printer to use an RS-232C communication interface. Optional plug-in boards are available for other communications interfaces.

♦ Communication cables are available for the various communication interfaces.

♦ Power supplies are available in 55 Watt or 75 Watt versions.

♦ 3-pin to 6-pin power connection adapter to allow previous version power supplies (or terminal cables) to be connected to the A758.

## Thermal Receipt Printer Options

♦ The optional receipt cutter.

## Impact Slip Printer Options

♦ The slip table is available in either standard or 2 extended sizes. An extended slip table is standard with the MICR check reader and flip options.

♦ The Magnetic Ink Character Recognition (MICR) check reader is built into the slip station. It reads checks that use standard E13B or CMC7 MICR fonts.

♦ Check Flip Option: after reading the MICR line on the front of the check and printing on the back, the printer is able to flip the check over and print on the face of the check.

## Electronics and Firmware Options

♦ 1 MB or 2 MB Expanded flash memory are available as factory configurations.

# Model Identification Key

Model Number ─────┐        ┌───── Major Model Number
                  │        │  ┌── Sub Model Number

A758-1025

Model A758-1025          VDC   24
Cust Part No             Amps  3.2
Revision
Serial No

**Axiohm** ™ PTE. LTD.
Ithaca, N.Y   Assembled in U.S.A.

C ℞ US    C E    Canada    N265
E 125100           ICES/NMB-003
                   class/classe A
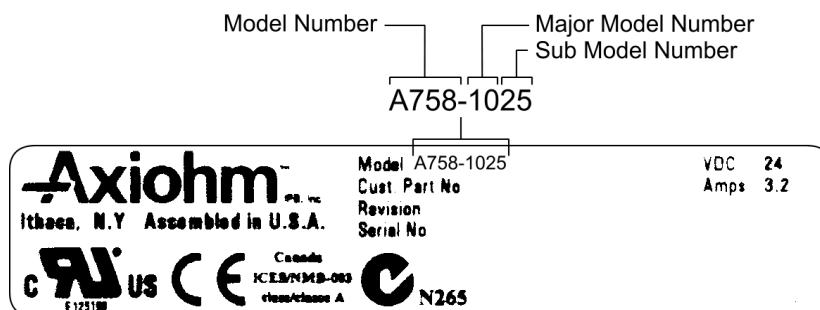
**A758 Model ID Key**

A 7 5 8 - X  X  X  X

                              1 = no knife
                              5 = knife

                    0 = no MICR
                    1 = MICR
                    2 = MICR and check flip
                    5 = check flip

          0 = 512K Flash memory (standard)
          1 = 1MB Flash memory
          2 = 2MB Flash memory

     1 = standard color

The set of options installed on a particular printer can be determined by looking at the printer's model number. The printer's model number appears on a label on the right side of the printer. Four-digit model numbers are assigned to the various A758 models based on the following formula:

♦ The first digit indicates the release vintage and color of the printer's case.

♦ The second digit indicates the amount of flash memory installed in the printer.

♦ The third digit indicates whether the printer has the MICR and/or check flip features.

♦ The fourth digit indicates whether the printer has a knife for cutting receipts.

For example, a printer with model number A758-1015 has a standard color case, 512K of flash memory, the MICR feature, and a knife for cutting receipts.

# Chapter 2: Setup Guide

- ♦ **Unpacking the Printer**

- ♦ **Choosing a Location**

- ♦ **Removing the Packing Restraints**

- ♦ **Connecting the Cables**

- ♦ **Loading Receipt Paper**

- ♦ **Putting in the Ribbon Cassette**

- ♦ **Testing the Printer**

# Unpacking the Printer

Save all packing materials in case you need to repack the printer. Check that the materials shipped with the printer match.

- Printer enclosed in a plastic bag and foam pack

- Thermal receipt paper roll (inside receipt bucket)

- Test printout protecting the printhead (inside receipt bucket)

- Cardboard support for cantilever (on slip table)

- Foam restraint for carriage (behind front cover)

- Power supply with cable connecting to printer and power supply cord connecting to power outlet (only if ordered with the printer)

- Ribbon cassette

- Installation report card (please complete this form and return to Axiohm)

- *A758 Thermal Receipt and Impact Slip Printer: Setup Guide*

- Communication cable, if ordered with the printer (from host computer to printer)

To report any missing materials, or to report a printer that was damaged during shipping, call your supplier or call an Axiohm representative at 1-(607) 274-2424.

# Choosing a Location

Receipt Cover

280 mm
(11.0 in.)

178 mm
(7.0 in.)

229 mm (9.0)

Extended
Slip Table

264 mm (10.4 in.)

347 mm (13.7 in.)
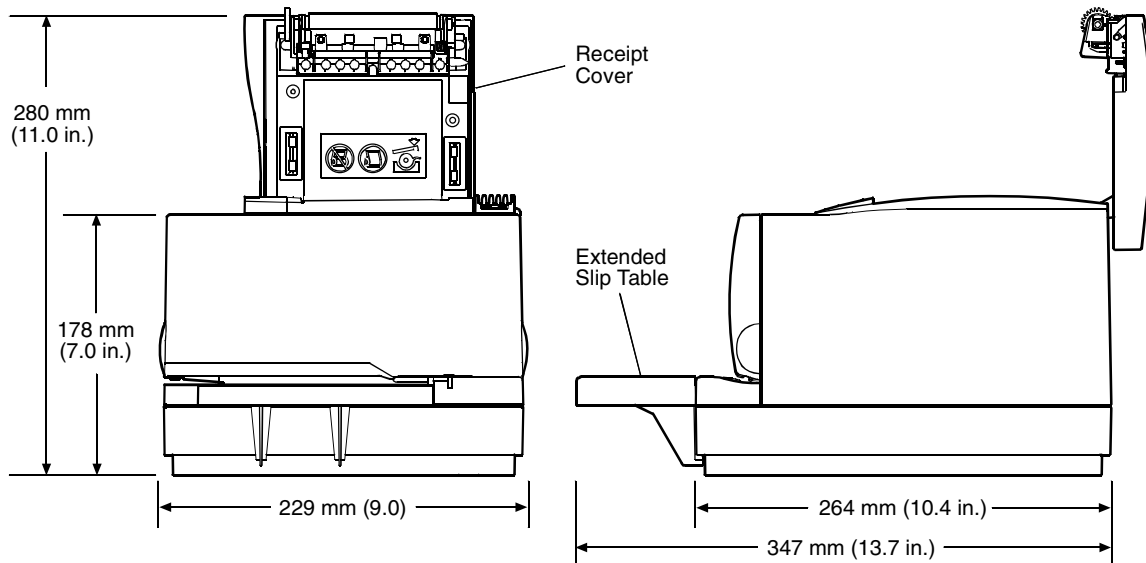
The A758 printer takes up relatively little counter space and may be set on or
near the host computer. With the RS-232C interface, you can place the printer up
to 50 feet from the host computer and power supply.

Place the printer on a level surface, and make sure there is enough room to open
the receipt cover to change the paper and to open the front cover to change the
impact printer's ribbon cassette. Leave several inches around the printer for
connecting and accessing the cables.

If the printer has an optional Magnetic Ink Character Recognition (MICR) check
reader installed, you may need to make additional adjustments to the printer's
location. Because devices such as CRT monitors or large metal surfaces affect the
printer's magnetic field, they can cause intermittent check reading errors.

# Remove the Packing Restraints

Front
Cover

Cardboard
Support

Carriage
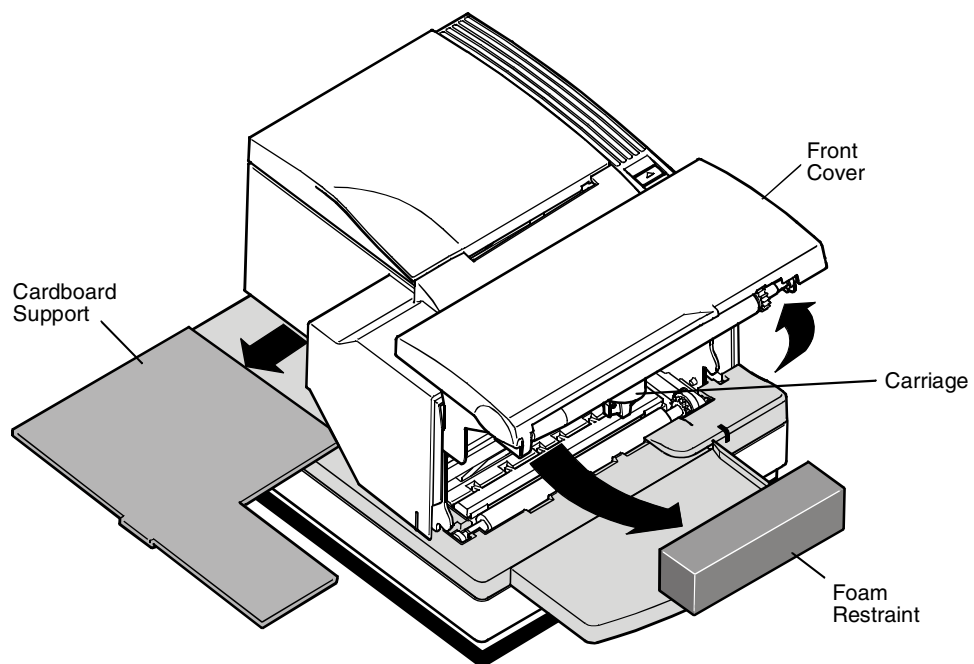
Foam
Restraint

1.   Open the front cover, remove the foam restraint holding the carriage.

2.   Remove the cardboard support from the slip path.

Receipt Cover

Paper Roll Supports

Paper Roll
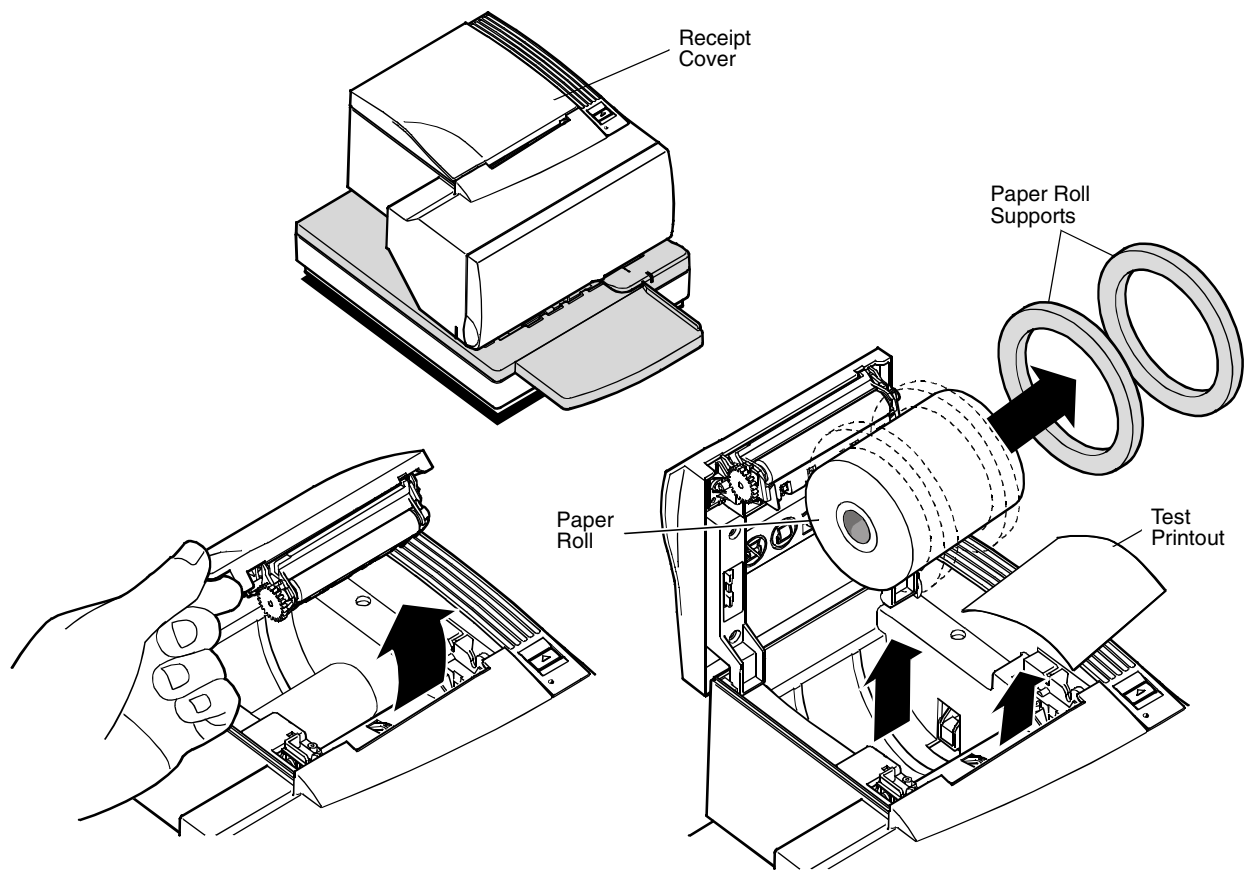
Test Printout

3. Open the receipt cover and remove the test printout.

4. Lift the thermal paper roll out of the paper bucket and remove the paper roll supports.

# Connecting the Cables

**Caution:** Connect the cables to the printer before plugging in the power supply. If power is received from the host computer, turn it off before connecting any cables.

Strain Relief

**Back of Printer**  Cash Drawer Connector    DIP Switches    Power Supply Connector    Communication Connector (9-pin connector shown)
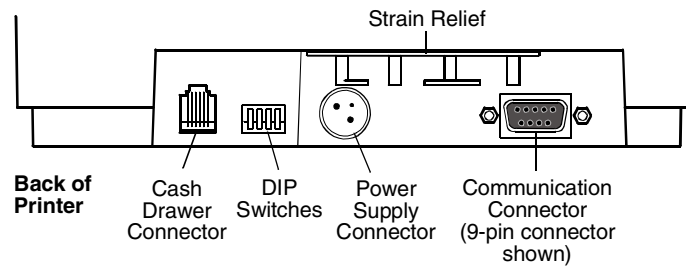
**Note:** Depending on your printer configuration, the connector panel may vary from the above illustration.

## Communication Cable

The communication cable connects the printer to the host computer. To install the communication cable:

1. Turn off the host computer.

2. Secure the communication cable to its connector under the printer in the location previously shown.

3. Connect the cable to the host computer.

## Cash Drawer Cables

The cash drawer cable connects the printer to one or two cash drawers.

1. Plug the cable into the cash drawer connector (standard phone jack) located at the rear of the printer.
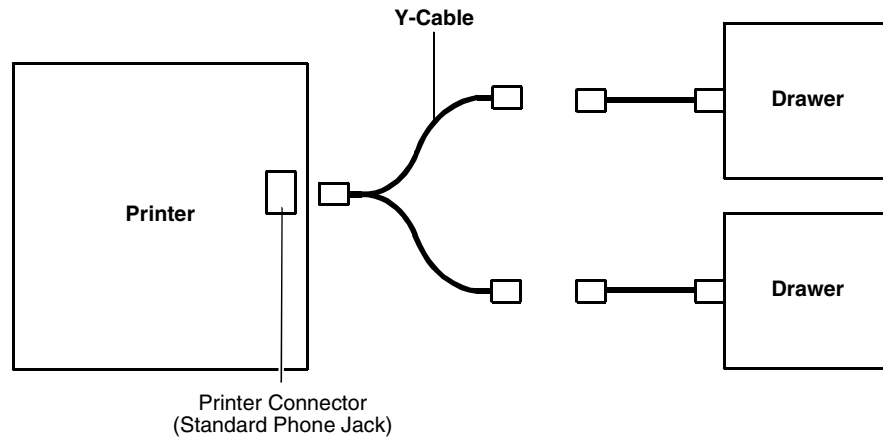


**Note:**

a. If your system has two cash drawers, attach a Y-cable to the printer's cash drawer connector as shown.

b. Leave some slack in the cord to route through the strain relief at a later time.

## Power Supply Cable

Connect the power supply cable last.

1. Plug the power cord into the power supply.
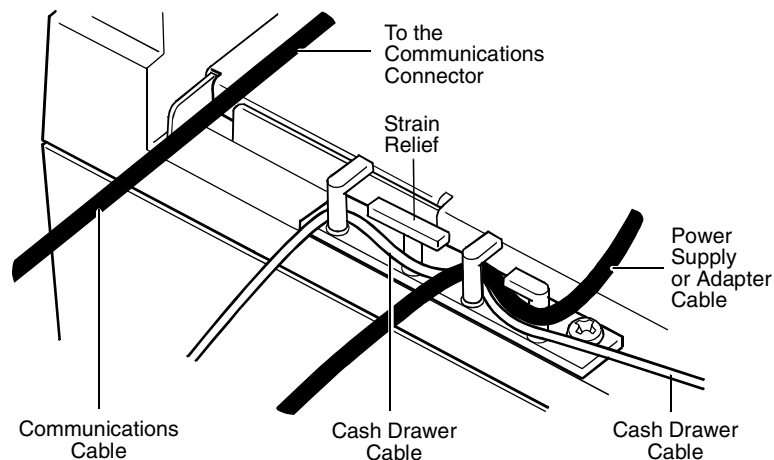


2. Route the cash drawer and the power supply cables through the stain relief as shown.

3. Plug the power cord into the power supply, then plug the power supply into an outlet. The Green LED on the top cover will light up.

# Loading Receipt Paper

1.  Tear off the end of the roll so that the edge is loose.

2.  Place the roll into the paper bucket with the paper unrolling from the bottom of the roll, and with a few inches of paper extending over the cabinet front.

**Note:** Paper must unroll from the bottom of the roll to insure that the image will print.
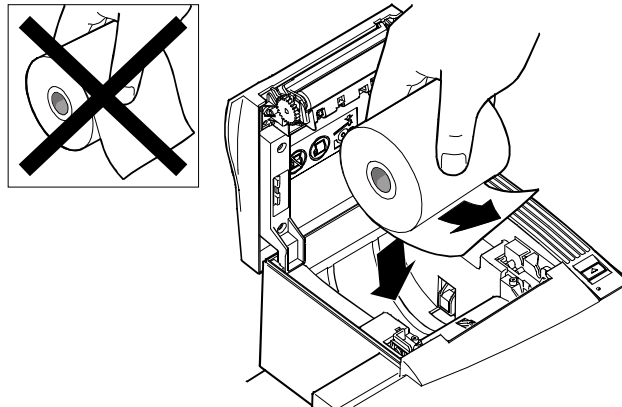


3.  Close the cover while holding the paper over the front of the cabinet.
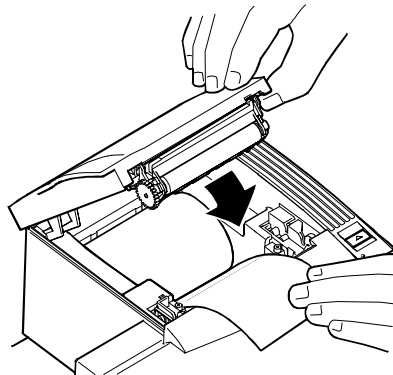


4.  Remove the excess paper by tearing it against the tear-off blade.
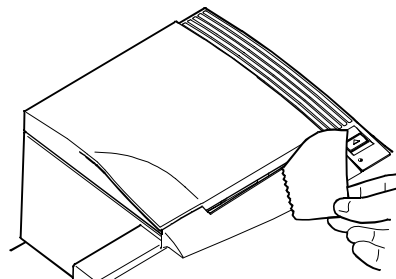


5.  Press the Paper Feed Button to advance the paper.

# Putting In the Ribbon Cassette

**Note:** You must use an approved Axiohm ribbon cassette with the check flip option to prevent jamming or other ribbon problems.

1. Unwrap and tighten the ribbon by turning the knob on the cassette in the direction of the arrow.

**Caution:** **DO NOT** remove the mylar shield.

Front
Cover

Knob

Ribbon
Cassette
(Shown in
Position)

Cassette

Printhead

Ribbon     Mylar
Shield
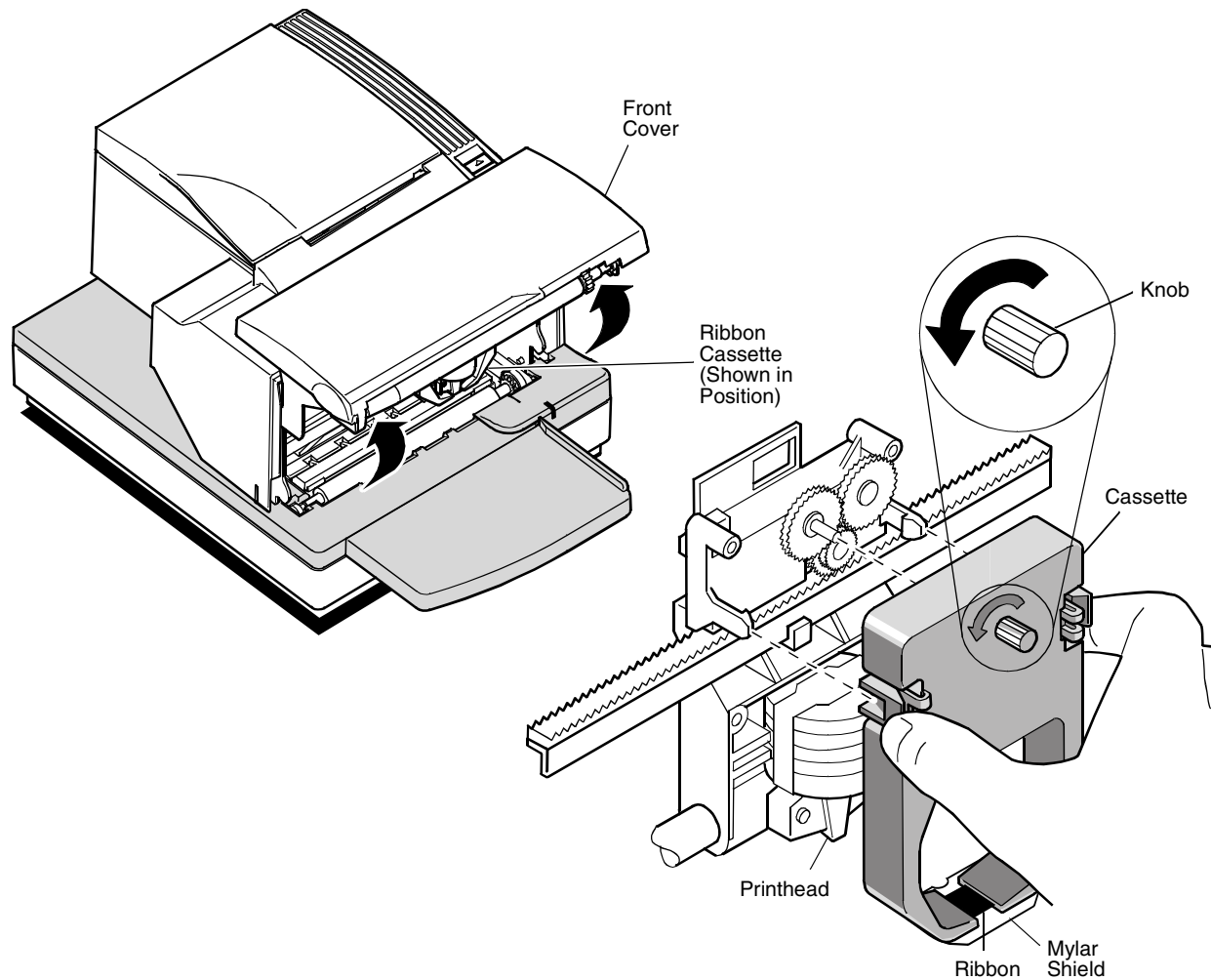
2. Open the printer's front cover, position the ribbon cassette onto the carriage, making sure the ribbon is underneath the printhead.

3. Snap the cassette into place and close the front cover.

# Testing the Printer

The Configuration Menu allows you to set general printer parameters. The test prints a list of various printer settings and partially cuts the paper if a knife is installed. The test printouts may vary depending on the printer model. To change the default settings, enter the Configuration Menu as instructed on the bottom of the test printout. The printout may be useful to a service representative if there is a problem. If something appears to be wrong with the test printout (such as missing or faded text) additional troubleshooting and diagnostic guides are available by calling 1-(607) 274-2424.

1.  To run the test, either:

    a.  Open and close the receipt cover while holding down the Paper Feed Button,

        OR,

    b.  Press the Paper Feed Button and the Reset Button at the same time.

2.  When the printer begins printing let go of the Paper Feed Button.

```
*** A758 - Diagnostics Form ***

Model number         : A758-1025
Serial number        : A991703053

Boot Firmware
    Revision         : V1.25
    CRC              : A866
    P/N              : 189-1073150A
Flash Firmware
    Revision         : V2.43
    CRC              : B74B
    P/N              : 189-1073151A

H/W parameters
    Flash Size          : 512 kbytes
    Flash Logos/Fonts   : 64 kbytes
    Flash User Storage  : 64 kbytes
    SRAM Size           : 256 kbytes
    CPU Clock Freq.     : 50 MHz
    Head Setting        : A
    Print Density       : 100 %
    Max Speed Step      : 31
    Max Power           : 55 W
    Knife               : Enabled
    Paper Low Sensor    : Enabled
    MICR                : Enabled
    Check Flip          : Enabled

Comm. Interface
    RX Buffer Size   : 4096
    Interface type   : RS232
    Parameters
        Baud Rate        : 115200
        Data Bits        : 8
        Stop Bit(s)      : 1
        Parity           : NONE
        Flow Control     : DTR/DSR
        Reception Errors : Ignore

To enter Printer Config Menu :
    1) Flip DIP switch #1 up
    2) Reset the printer, while holding
       the Paper Feed button down
```

```
*** A758 - Printer Config Menu ***

This config menu allows you to set general printer
parameters

Sub-menus are entered and selections are made using
the Paper Feed Button :

  - short click : Feed Button is quickly depressed
                  then released
  - long click  : Feed Button is held down more than
                  1 second then released

CAUTION !!
    The settings are predetermined in factory and
    should generally not be changed.
    If you must change the settings do so carefully
    to avoid changing other functions.

                  ***************

********** MAIN MENU **********
*********************************

Select a sub-menu :
  - EXIT                          -> 1 click
  - Print Current Configuration   -> 2 clicks
  - Set Communication Interface   -> 3 clicks
  - Set Diagnostics Modes         -> 4 clicks
  - Set Emulation/Software Options -> 5 clicks
  - Set Hardware Options          -> 6 clicks

Enter code, then hold Button DOWN
at least 1 second to validate
```

**Important:** *Ensure that the configuration settings match your host computer, if not, enter the Configuration Menu to make changes.*

**Configuration Menu** and **Print Test** samples (shown approximately 60% of size).

**Caution:** Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

3.    Press the Paper Feed Button the number of clicks for the printer settings you want.

**Note:** Press the Paper Feed Button for at least one second to validate the selection.

# Chapter 3: Using the Printer

- ♦ **Printer Controls**

- ♦ **Changing the Receipt Paper**

- ♦ **Replacing the Ribbon Cassette**

- ♦ **Printing on Forms or Checks**

- ♦ **Validating and Verifying Checks**

- ♦ **Clearing Check Flip Paper Jams**

- ♦ **Testing the Printer**

- ♦ **Printer Configuration**

- ♦ **Basic Troubleshooting**

- ♦ **Other Serious Problems**

- ♦ **Contacting a Service Representative**

- ♦ **Returning a Printer**

# Printer Controls
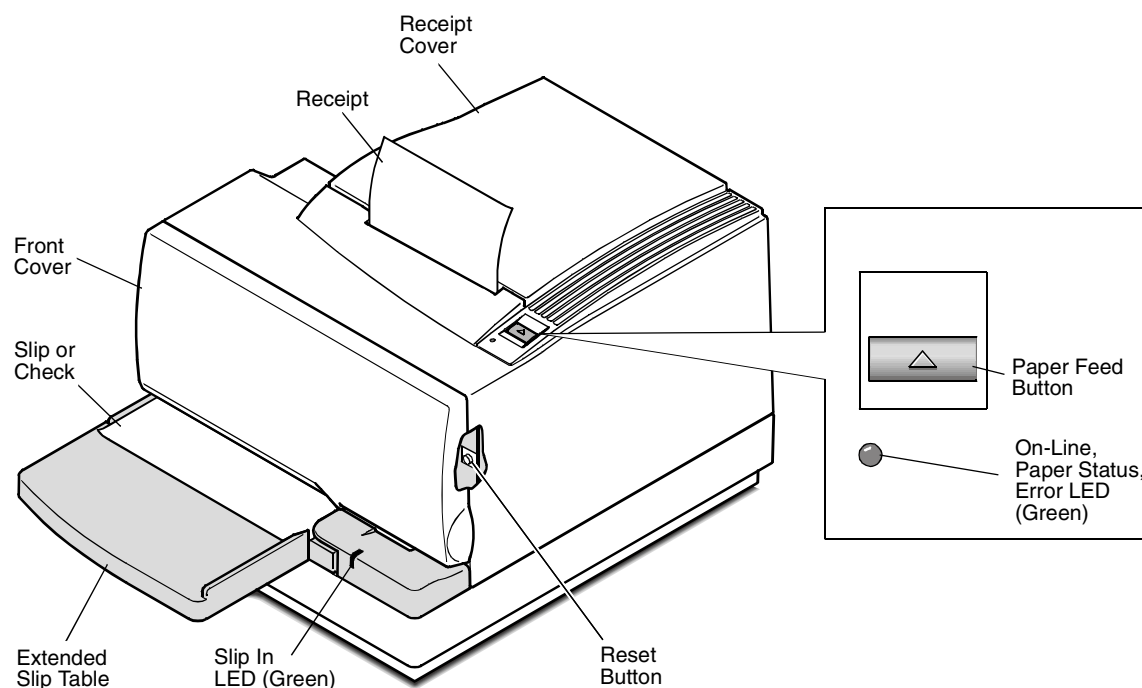


The printer has the following controls:

♦   The Paper Feed Button advances the receipt paper.

♦   The On Line, Paper Status, Error LED shows the printer status by shining or flashing.

♦   The Slip-in LED indicates that a form is inserted properly.

♦   The Reset Button clears the printer's memory or begins special modes.

The printer also indicates its status when it is first turned on, or after it has been reset, by beeping. A single beep indicates the printer has successfully completed its startup routine. But if the printer beeps in a single, double, or triple pattern at first power on, please call your service representative.

# Changing the Receipt Paper

Change the paper when either a colored stripe appears on the receipt paper or the printer's On Line, Paper Status, Error LED slowly flashes (indicating that $15 \pm 10$ feet of paper remains on the roll). Change the paper as soon as possible to avoid running out of paper part way through a transaction.

If the On Line, Paper Status, Error LED blinks fast, the paper is out. Change the paper immediately or data may be lost. The printer will not operate without paper, but it may continue to accept data into memory from the host computer. Because the printer cannot print any transactions, this data in memory may be lost.
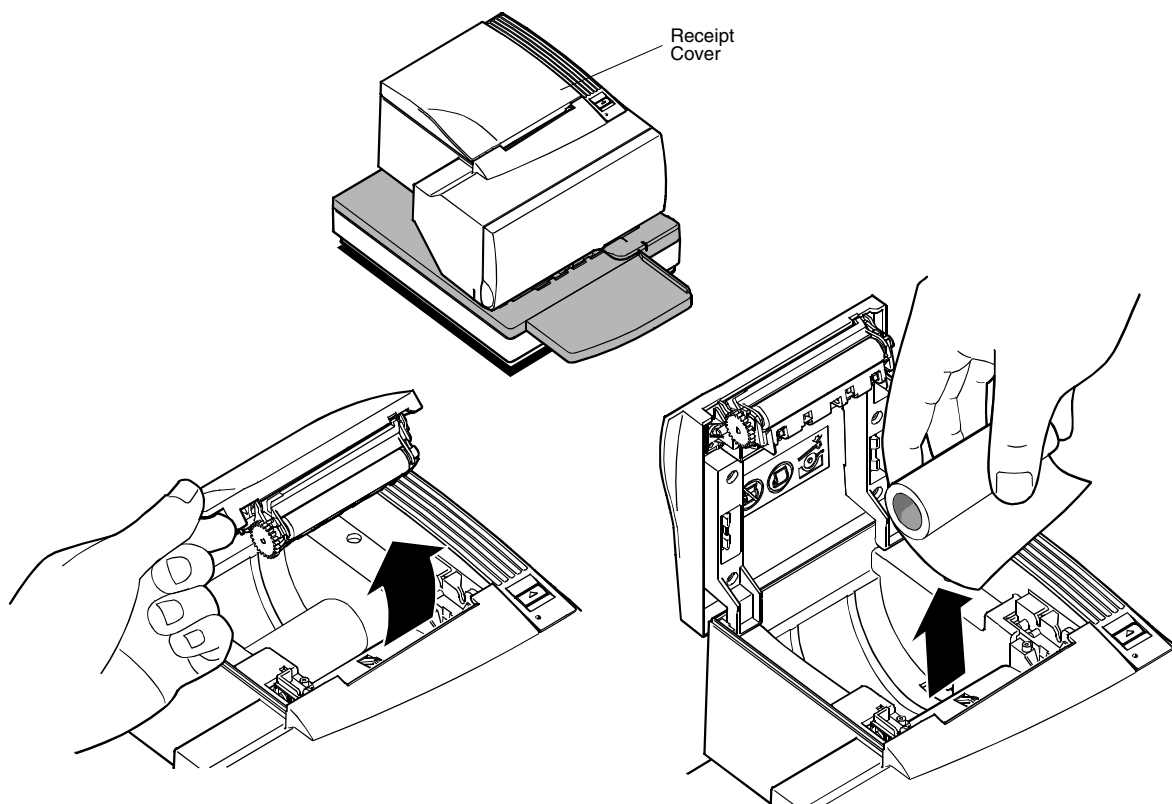


To change the receipt paper:

1.  Open the cover and remove the used roll.

2.  Tear off the end of the new roll so that the edge is loose.

3.  Place the roll into the paper bucket with the paper unrolling from the bottom of the roll, and with a few inches of paper extending over the cabinet front. Paper must unroll from the bottom of the roll to insure the image will print.

4.  Close the cover while holding the paper over the front of the cabinet.

5.  Remove the excess paper by tearing it against the tear-off blade.

6.  Advance the paper if necessary by pressing the Paper Feed Button.

# Replacing the Ribbon Cassette

Change the impact printer's ribbon cassette if it is printing lightly.

**Note:** You must use an approved Axiohm ribbon cassette with the check flip option to prevent jamming or other printing problems.
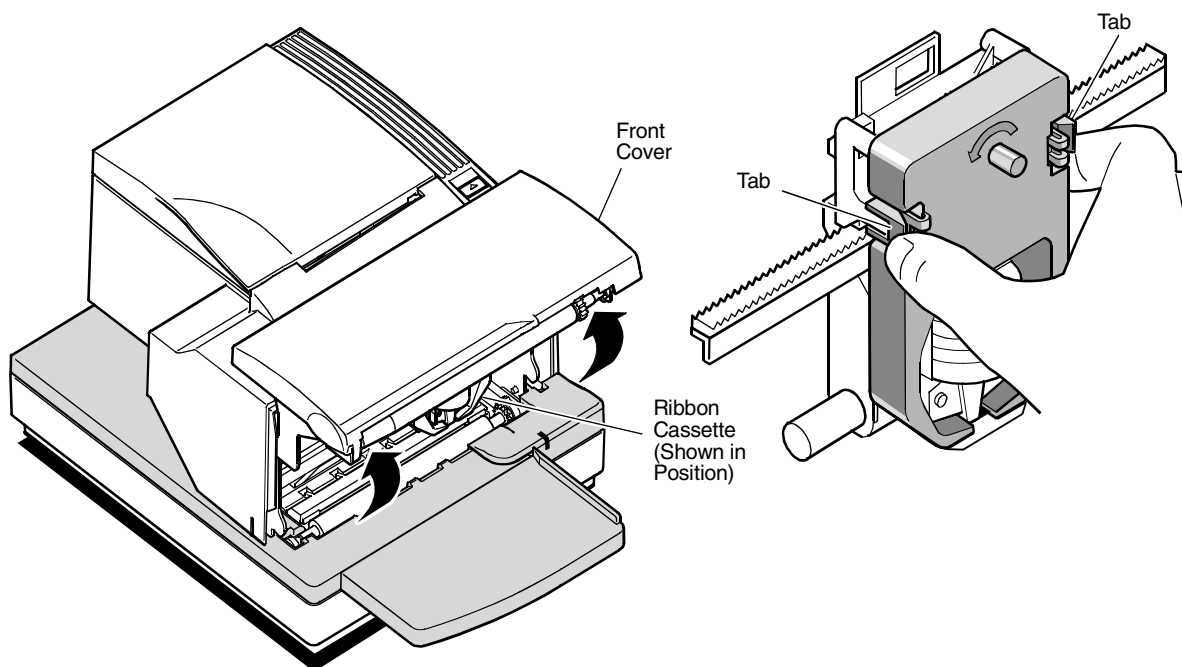
1. Open the printer's front cover and pinch the tabs of the old ribbon cassette to remove it.

Front
Cover

Ribbon
Cassette
(Shown in
Position)

Knob

Cassette

Printhead

Mylar
Shield
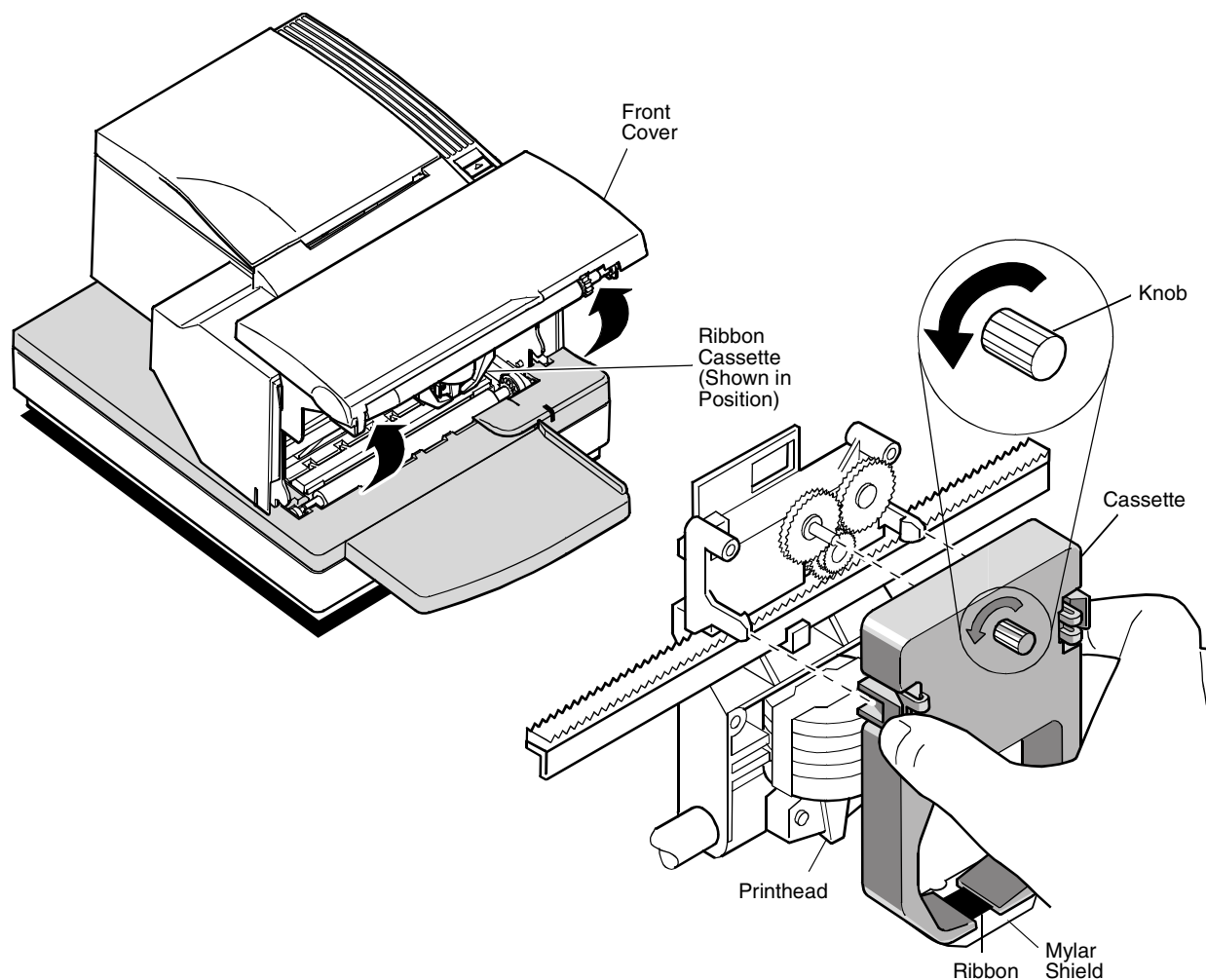
Ribbon

2.   Unwrap and tighten the new ribbon by turning the knob on the cassette in
     the direction of the arrow.

**Caution:  Do not** remove the Mylar shield.

3.   Position the new ribbon cassette onto the carriage, making sure the ribbon is
     underneath the printhead.

4.   Snap the cassette into place and close the front cover.

# Printing on Forms or Checks

There are several types of transactions that may require the insertion of a form or check into the printer:

♦ Credit card transaction

♦ Multiple-part forms such as credit transactions or merchandise returns

♦ Electronic funds transfers

♦ Check printing (printing the date, payee, and amount on the check face)

♦ Check endorsement

Although the illustration on the following page shows a check being inserted into the printer, these instructions apply to any type of form. The A758 can print on forms up to five parts thick.

**Check Orientation**
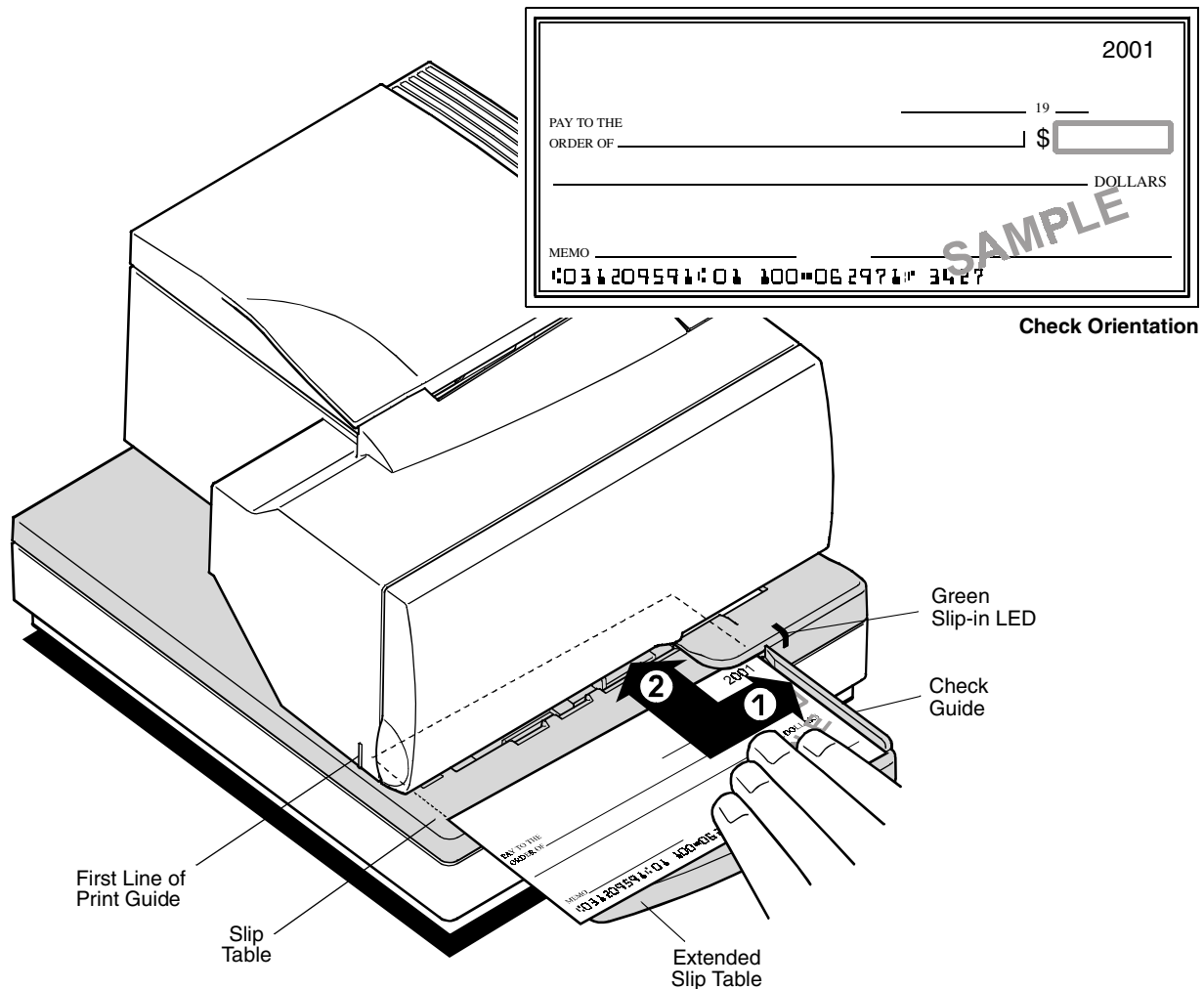
To print on a form or check:

1.  Insert the form or check (check shown in the illustration) from the front and place it on the Slip Table with the print side up. If the form is extra long, you may need to insert it from the side. A slight resistance may be felt when the form comes in contact with the Form Stop.

2.  Slide the form or check to the right until it aligns against the Check Guide.

3.  Slide a short form or check toward the back of the printer until it contacts the Form Stop (it won't be able to go any further).

    For a long form, position it appropriately using the First Line of Print Guide.

    The green Slip-in LED on the Slip Table turns on when the form or check is properly inserted (the form has to cover two sensors on the Slip Table).

4.  Follow the instructions from the host computer. The printer begins printing.

5.  Remove the form or check after it has been fed back out.

6.  Follow the instructions from the host computer to finish the transaction.

# Verifying and Validating Checks

If the printer has the optional MICR check reader, checks are verified and then validated. If the printer also has the optional check flip feature, the printer is able to flip the check over and print on the front of the check.

Note: To ensure that checks are properly verified and validated, they must be free of folds and wrinkles and inserted correctly into the MICR printer. Smooth a wrinkled or folded check for best performance.

**Check Orientation - Face down**

ENDORSE HERE

MEMO

DO NOT WRITE, STAMP
RESERVED FOR FINANCIAL INSTITUTION USE

FEDERAL RESERVE BOARD OF GOVERNOR'S REG. CC

Green
Slip-in LED

Check
Guide

First Line of
Print Guide

Slip
Table

Extended
Slip Table
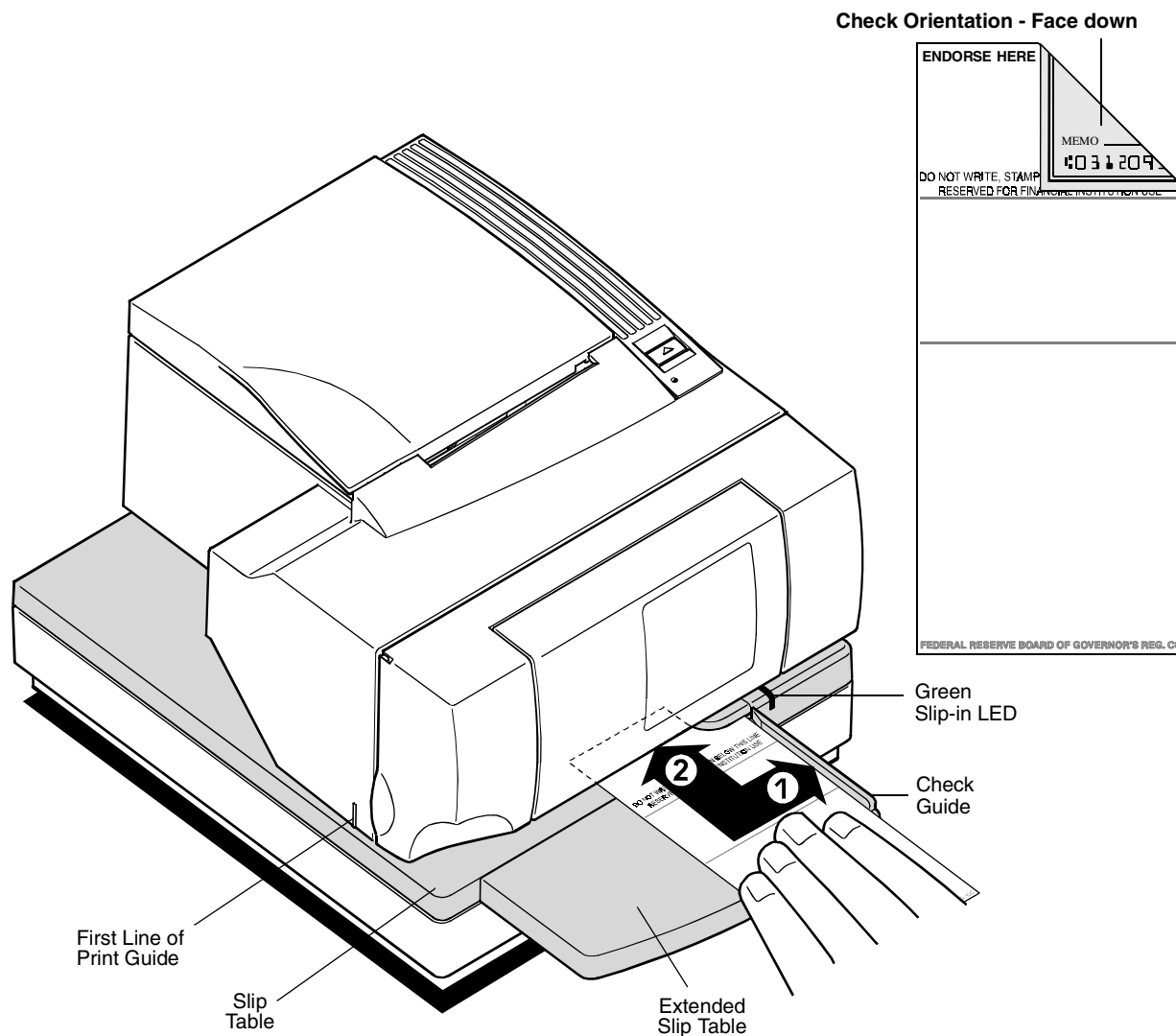
To verify and validate a check:

1.  Place the check, face down on the Slip Table, with the bottom edge of the check to the right. Move the check to the right until it aligns against the Check Guide.

2.  Slide the check straight forward into the printer until it stops. The green Slip-in LED on the front of the printer comes on.

    **IMPORTANT:**  Hold the check to the right, against the Check Guide and release it as soon as the printer begins to run.

3.  Follow the instructions on the host computer to complete the MICR process:

    a.  When instructed by the host, the check is fed into the printer, read and backed out to a position ready for endorsement, if desired.

    b.  With the optional check-flip feature, the check is fed into the printer, verified, fed up into the check flip mechanism, flipped, fed back into the printer, printed on the front and released.

    **Note:**  If the terminal indicates an incorrect read of the MICR:

    - ♦  Remove the check.

    - ♦  Reinsert the check, ensuring instructions 1 through 3 above are followed.

4.  Only remove the check when it is fully released by the printer.

5.  Continue to follow the instructions from the host computer to finish the transaction.

# Clearing Check Flip Paper Jams

Check

Check Flip
Window Door
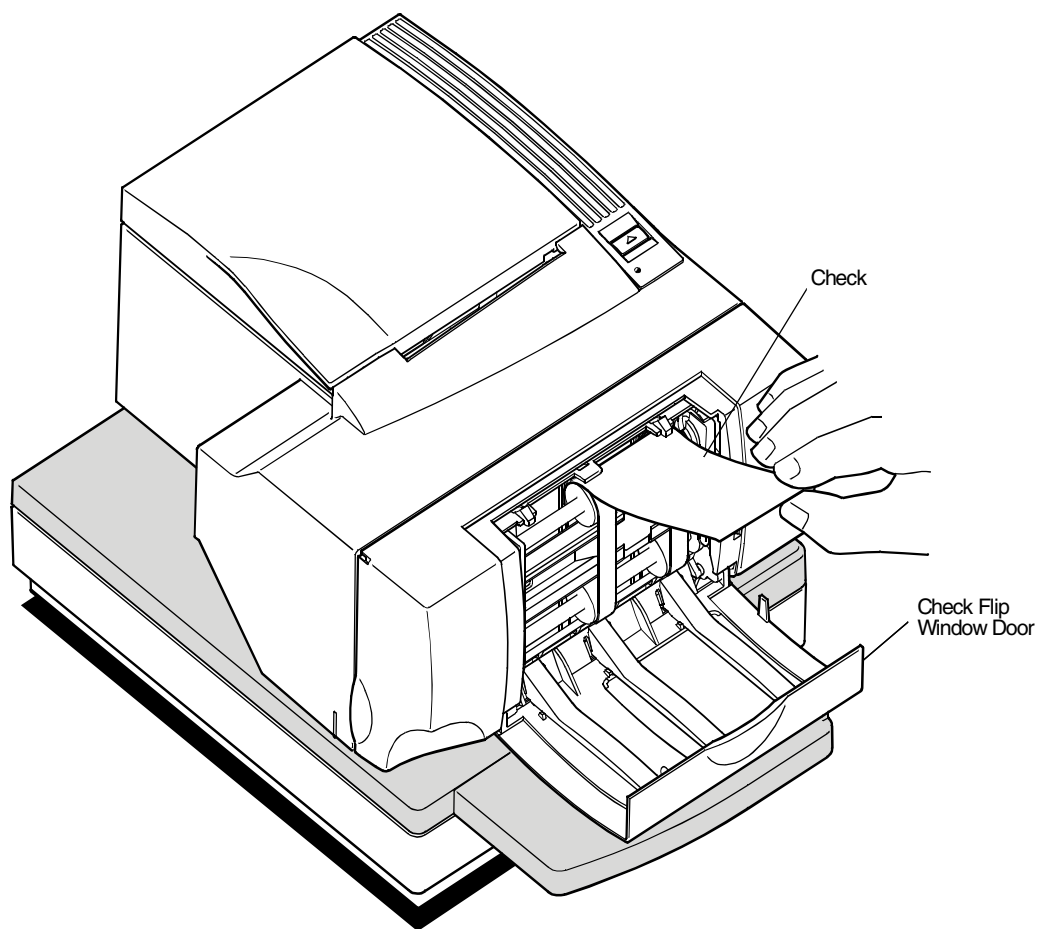
To clear a paper jam from the optional check flip assembly:

1.  Look in the window of the check flip assembly. If the jammed check is
    visible, open the window and remove it.
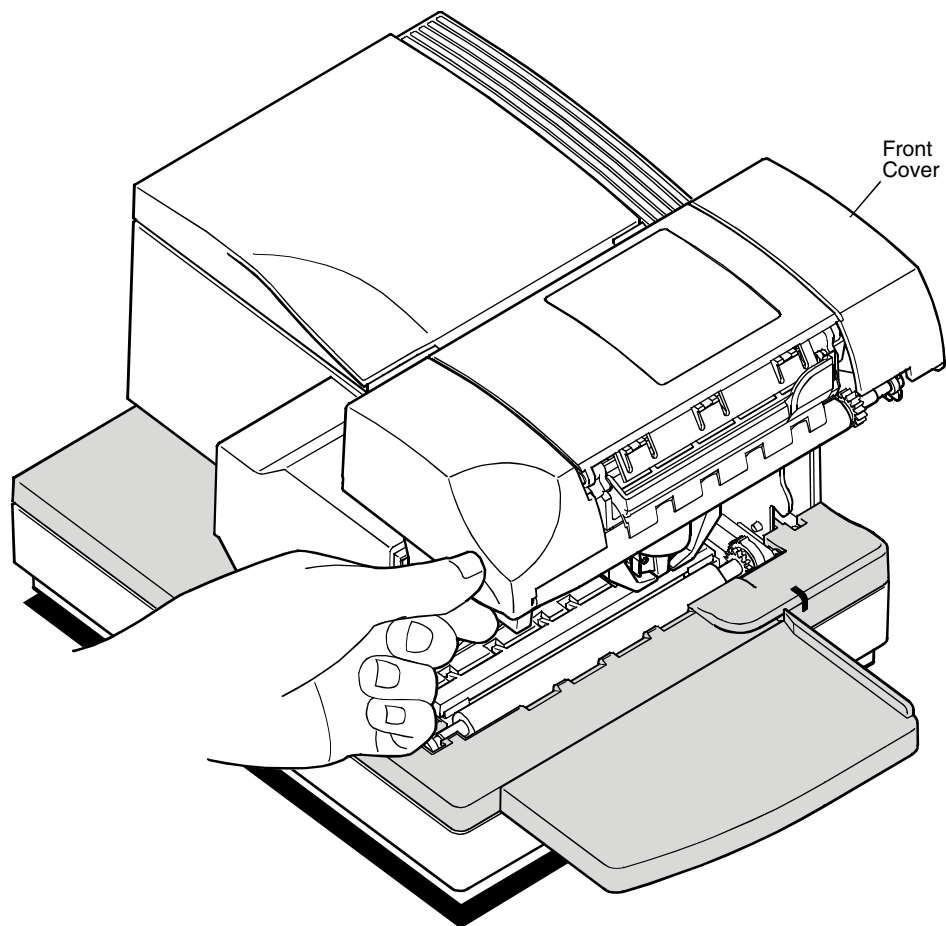
Front
Cover

2.   If the jammed check is not visible in the window, open the Front Cover and remove the jammed check from behind the check flip assembly.

# Testing the Printer

The Configuration Menu allows you to set general printer parameters. The test prints a list of various printer settings and partially cuts the paper if a knife is installed. The test printouts may vary depending on the printer model. The printout may be useful to a service representative if there is a problem. To change the default settings, enter the Configuration Menu as instructed on the bottom of the test printout. If something appears to be wrong with the test printout (such as missing or faded text), see the troubleshooting section in this document.

1.  To run the test, either:

    a.  Open and close the receipt cover while holding down the Paper Feed Button.

        OR

    b.  Press the Paper Feed Button and the Reset Button at the same time.

2.  When the printer begins printing let go of the Paper Feed Button.

**Caution:** Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.

Press the Paper Feed Button the number of clicks for the printer settings you want.

**Note:** Press the Paper Feed Button for at least one second to validate the selection.

```
*** A758 - Diagnostics Form ***

Model number          : A758-1025
Serial number         : A991703053

Boot Firmware
    Revision          : V1.25
    CRC               : A866
    P/N               : 189-1073150A
Flash Firmware
    Revision          : V2.43
    CRC               : B74B
    P/N               : 189-1073151A

H/W parameters
    Flash Size        : 512 kbytes
    Flash Logos/Fonts : 64 kbytes
    Flash User Storage : 64 kbytes
    SRAM Size         : 256 kbytes
    CPU Clock Freq.   : 50 MHz
    Head Setting      : A
    Print Density     : 100 %
    Max Speed Step    : 31
    Max Power         : 55 W
    Knife             : Enabled
    Paper Low Sensor  : Enabled
    MICR              : Enabled
    Check Flip        : Enabled

Comm. Interface
    RX Buffer Size    : 4096
    Interface type    : RS232
    Parameters
        Baud Rate     : 115200
        Data Bits     : 8
        Stop Bit(s)   : 1
        Parity        : NONE
        Flow Control  : DTR/DSR
        Reception Errors : Ignore

To enter Printer Config Menu :
  1) Flip DIP switch #1 up
  2) Reset the printer, while holding
     the Paper Feed button down
```

```
*** A758 - Printer Config Menu ***

This config menu allows you to set general printer
parameters

Sub-menus are entered and selections are made using
the Paper Feed Button :

  - short click : Feed Button is quickly depressed
                  then released
  - long click  : Feed Button is held down more than
                  1 second then released


CAUTION !!
    The settings are predetermined in factory and
    should generally not be changed.
    If you must change the settings do so carefully
    to avoid changing other functions.

              **************

********* MAIN MENU **********
*******************************

Select a sub-menu :
  - EXIT                         -> 1 click
  - Print Current Configuration  -> 2 clicks
  - Set Communication Interface  -> 3 clicks
  - Set Diagnostics Modes        -> 4 clicks
  - Set Emulation/Software Options -> 5 clicks
  - Set Hardware Options         -> 6 clicks

Enter code, then hold Button DOWN
at least 1 second to validate
```

***Important:*** *Ensure that the configuration settings match your host computer, if not, enter the Configuration Menu to make changes.*

**Configuration Menu** and **Print Test** samples (show approximately 60% of size).

# Printer Configuration

Printers are generally shipped with all appropriate configuration settings pre-set at the factory. The only time the user should need to change the printer configuration is if a new option is installed or the firmware is changed. It is also possible the user may need to run certain tests using the Configuration Menu.

The user configures the printer using a convenient Configuration Menu that is printed on receipt paper. The Configuration Menu prints instructions and setting options interactively as the user goes through the configuration process. The following functions and parameters can be changed with the scrolling Configuration Menu:

- Communication Interface

    - Interface Type
    - Baud Rate
    - Number of Data Bits
    - Number of Stop Bits
    - Parity
    - Hardware (DTR/DSR) or Software (XON/XOFF) Flow Control
    - Data Reception Errors

- Diagnostic Modes

    - Normal Mode
    - Datascope Mode
    - Receipt Test Mode
    - Slip Test Mode
    - MICR Test Mode
    - Check Flip Test Mode

- Emulation/Software Options

    - Printer Emulations
    - Printer ID Mode
    - Default Lines Per Inch
    - Carriage Return Usage

- Hardware Options

    - Print Density
    - Maximum Power
    - Knife Options
    - Paper Low Sensor
    - Printhead Resistance
    - MICR Option
    - Check Flip Option

## Configuring the Printer

Use the Configuration Menu to select functions or change various settings as indicated in the preceding sections. The Configuration Menu prints instructions and setting options interactively as the user goes through the configuration process.

**Caution:** Be extremely careful changing any of the printer settings to avoid inadvertently changing other settings that might affect the performance of the printer.



DIP Switch          **Back of Printer**

1.   Set DIP Switch 1 to On.
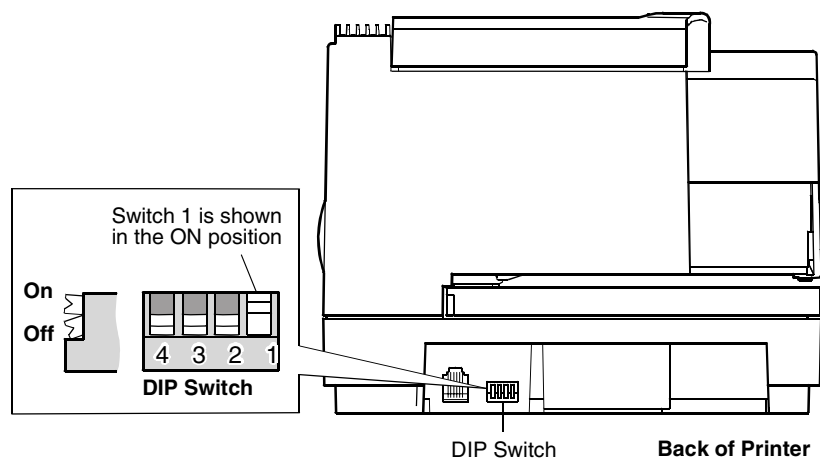


**Front of Printer**                            Front Cover                Reset Button
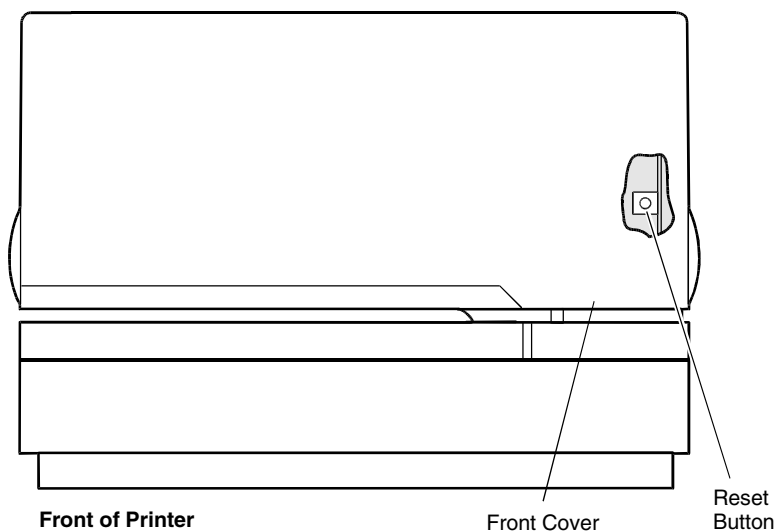
2.   Press the Reset Button while holding the Paper Feed Button.

The printer beeps, prints the current configuration, then prints the first question.

```
*** A758 - Printer Config Menu ***


This config menu allows you to set general printer
parameters

Sub-menus are entered and selections are made using
the Paper Feed Button :

    - short click : Feed Button is quickly depressed
                    then released
    - long click  : Feed Button is held down more than
                    1 second then released


CAUTION !!
    The settings are predetermined in factory and
    should generally not be changed.
    If you must change the settings do so carefully
    to avoid changing other functions.

                    **************


********* MAIN MENU *********
*****************************

Select a sub-menu :
    - EXIT                             ->  1 click
    - Print Current Configuration      ->  2 clicks
    - Set Communication Interface      ->  3 clicks
    - Set Diagnostics Modes            ->  4 clicks
    - Set Emulation/Software Options   ->  5 clicks
    - Set Hardware Options             ->  6 clicks

Enter code, then hold Button DOWN
at least 1 second to validate
```

3. Follow all the instructions on the scrolling menu.

4. Press the Paper Feed Button to make the selections.

   The instructions indicate whether to select something with a short click, a long click, or a series of short clicks. Indicate Yes with a long click, No with a short click.

   Press and hold the Paper Feed Button for at least one second for a long click. Press the Paper Feed Button quickly for a short click.

5. When finished, set DIP Switch 1 to Off.

6. Press the Reset Button. The printer resets with the new selections.

## Communication Interface

The Configuration Menu gives the user the option of setting the printer to use an RS-232C serial port. (See "Configuring the Printer" for instructions on how to enter the Configuration Menu.)

### RS-232C Serial Interface Settings

If the user sets the printer to use an RS-232C serial interface, the Configuration Menu can be used to set the following RS-232C-specific settings:

♦ Set a baud rate of 115200, 57600, 38400, 19200, 9600, 4800, 2400, or 1200 baud

♦ Set the number of data bits to seven or eight

♦ Set the number of stop bits to one or two

♦ Enable or disable parity

♦ Set flow control to software (XON/XOFF) or Hardware (DTR/DSR)

♦ Set the printer to ignore data errors or print a "?" upon encountering an error

The settings used will depend on the software the operator is using and the capabilities of the host computer.

## Diagnostic Modes

This function allows the user to put the printer into the following diagnostic modes:

♦ **Normal Mode:** this is the normal operating mode of the printer.

♦ **Datascope Mode:** the receipt printer prints incoming commands and data in hexadecimal format.

♦ **Receipt Test Mode:** the receipt printer prints two code pages.

♦ **Slip Test Mode:** the slip printer prints two code pages.

♦ **MICR Test Mode:** the receipt printer prints all characters recognized by the MICR.

♦ **Check Flip Test Mode:** the check flip mechanism will flip an inserted check.

These diagnostic modes are enabled or disabled by using the Configuration Menu. See "Configuring the Printer," for instructions on how to enter the Configuration Menu.

### Datascope Mode

Datascope Mode allows the user to test the printer's communications. When in Datascope Mode the printer receives all communications, but instead of executing the commands it prints them out on receipt paper as hexadecimal numbers in the order received. For example, the ASCII character "A" is printed as the hexadecimal number 41 and so on.

*To run the Datascope Mode:*

1. Enter the Configuration Menu. See "Configuring the Printer for instruction on how to enter the Configuration Menu.

2. After you have enabled the Datascope Mode through the Configuration Menu, exit the Configuration Menu.

3. Run a transaction from the host computer.
All commands and data sent from the host computer will be printed as hexadecimal numbers as shown in the illustration.

```
10                                    :
1B 76                                 :    v
1C 12 20 20 20 20 20 20 20 20 20 20   :
20 20 2A 20 20 43 4F 4E 54 49 4E 55   :    *  CONTINU
4F 55 53 20 52 4F 4C 4C 20 20 2A 20   : OUS ROLL   *
20 20 17 1C 20 20 20 20 20 20 20 20   :
20 20 20 20 20 20 20 20 20 20 20 20   :
20 20 20 20 20 20 51 75 61 6E 74 69   :       Quanti
74 79 20 20 34 35 20 20 20 20 20 20   : ty  45
20 20 20 20 20 20 20 20 20 24 31 36   :          $16
2E 36 35 17 1C 20 20 20 20 20 20 20   : .65
```

*To exit the Datascope Mode:*

1. Enter the Configuration Menu again.

2. Disable the Datascope Mode.

3. Exit the Configuration Menu.

   The printer is in Normal Mode and can communicate with the host computer.

## Receipt Test Mode

*To run the Receipt Test Mode:*

1. Enable the Receipt Test Mode through the Configuration Menu. See "Configuring the Printer," for instructions on how to enter the Configuration Menu.

2. Push Paper Feed Button and the receipt station will print two code pages.

3. The test ends with a cut.

4. Go to step 2 again to repeat this test.

*To exit the Receipt Test Mode:*

1. Enter the Configuration Menu again.

2. Disable the Receipt Test Mode.

3. Exit the Configuration Menu.

   The printer is in Normal Mode and can communicate with the host computer.

## Slip Test Mode

*To run the Slip Test Mode:*

1. Enable the Slip Test Mode through the Configuration Menu, (See "Configuring the Printer," for instructions on how to enter the Configuration Menu). Then exit the Configuration Menu.

2. Insert a slip into the slip station.

3.  Push the Paper Feed Button.

    Two code pages will be printed.

4.  Go to step 2 again to repeat this test.

*To exit the Slip Test Mode:*

1.  Enter the Configuration Menu again.

2.  Disable the Slip Test Mode.

3.  Exit the Configuration Menu.

    The printer is in Normal Mode and can communicate with the host computer.

## MICR Test Mode

MICR Test Mode allows the user to test whether the MICR is operating correctly. When the printer is in this mode the MICR reads the characters on a check as usual, but instead of transmitting the values to the software it prints them on receipt paper.

*To run the MICR Test Mode:*

1.  Enter the Configuration Menu. See "Configuring the Printer," for instructions on how to enter the Configuration Menu.

2.  After enabling the MICR Test Mode through the Configuration Menu, exit the Configuration Menu.

3.  Insert a check into the slip station. (See "Verifying and Validating Checks" section.)

4.  The printer waits until a check is inserted and detected before the platen closes and the characters are read by the MICR check reader. The decoded data is printed on receipt paper, the platen is opened, and the test is re-started.

5.  The printed numbers should match the numbers on the check. If the MICR check reader misreads a character, the test prints a question mark "?". If the MICR check reader is unable to read any characters, the test prints "NO MICR CHARACTERS."

```
 MICR Data :
 )123456789)12345677(      010925
```

*To exit the MICR Test Mode:*

1.  Enter the Configuration Menu again.

2.  Disable the MICR Test Mode.

3.  Exit the Configuration Menu.

    The printer is in Normal Mode and can communicate with the host computer.

## Check Flip Test Mode

*To run the Check Flip Test Mode:*

1.  Enable the Check Flip Test Mode through the Configuration Menu (See "Configuring the Printer," for instructions on how to enter the Configuration Menu), then exit the Configuration Menu.

2.  Insert a check as if validating the check, lengthwise and face down into the slip station. (See "Verifying and Validating Checks" section to insert check.) A check must be used—if any other slip or form is inserted the printer will not conduct the test.

**Check Orientation - Face down**

ENDORSE HERE

MEMO
031209

DO NOT WRITE, STAMP
RESERVED FOR FINANCIAL INSTITUTION USE

FEDERAL RESERVE BOARD OF GOVERNOR'S REG. CC

Green
Slip-in LED

Check
Guide

First Line of
Print Guide

Slip
Table

Extended
Slip Table
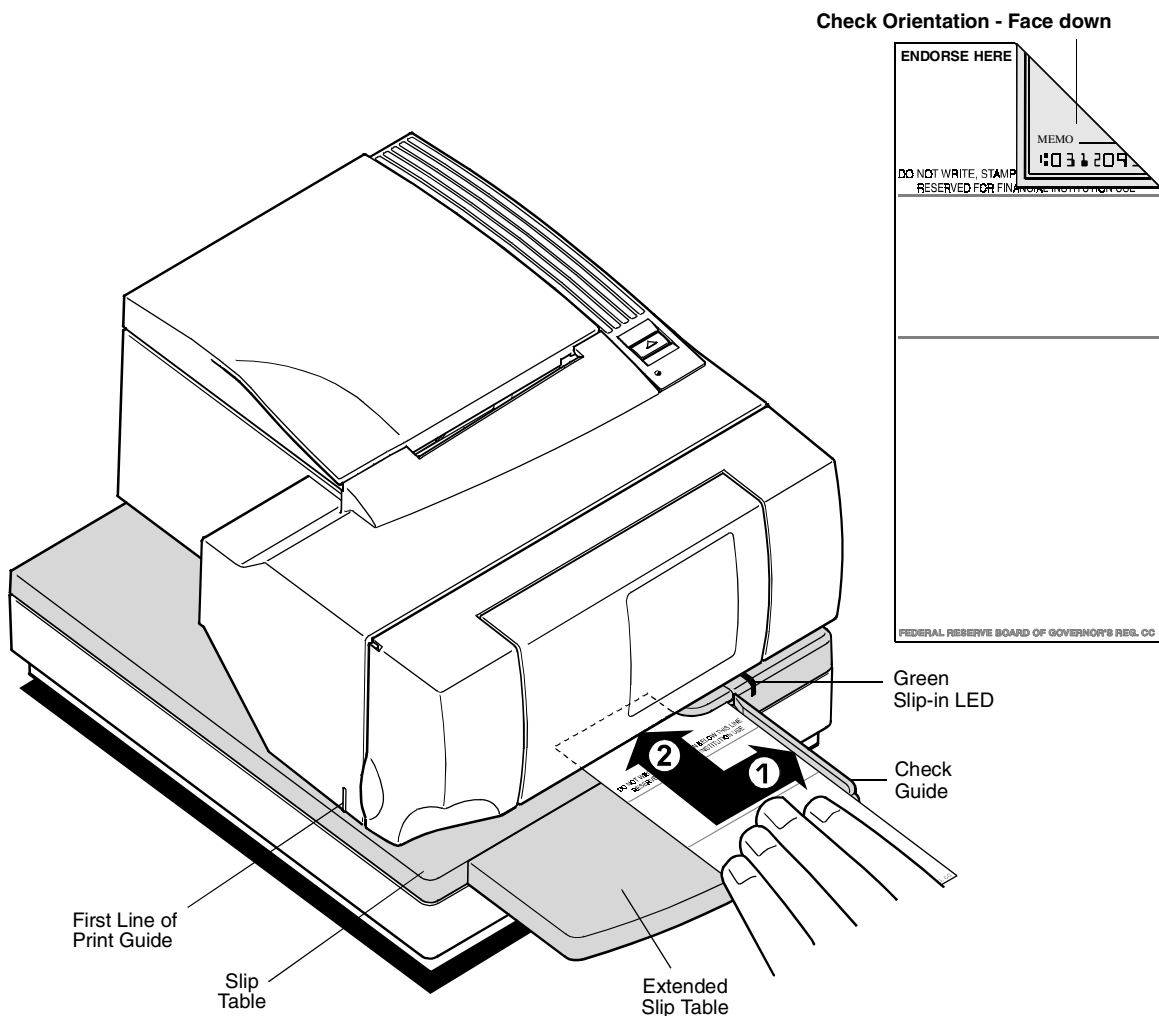
3.  Push Paper Feed Button.

The check then goes through the flip routine only—no printing takes place.

*To exit the Check Flip Test Mode:*

1.  Enter the Configuration Menu again.

2.  Disable the Check Flip Test Mode.

3.  Exit the Configuration Menu.

    The printer is in Normal Mode and can communicate with the host computer.

# Emulation/Software Options

### Printer Emulations

Printer emulations determine the commands that are available to the printer. They are set by using the Configuration Menu. (See "Configuring the Printer" for instructions on how to enter the Configuration Menu.) The available options are:

♦   A758 Native (enables all new functions)

♦   A756 Emulation (for use with legacy software)

### Printer ID Mode

This switch is used to determine what Printer ID value is returned in response to a Transmit Printer ID (1D 49 01) when the printer is in A756 Emulation Mode. The printer can be configured to send back the ID of the A758 or the A756.

### Default Lines Per Inch

This function allows the user to set the default lines per inch printed by the thermal receipt printer to 6, 7.52 or 8.13. (See "Configuring the Printer" for instructions on how to enter the Configuration Menu to change this setting.)

### Carriage Return Usage

This function allows the printer to ignore or use the Carriage Return (hexadecimal 0D) command depending on the application. Some applications expect the command to be ignored while others use the command as a print command. (See "Configuring the Printer" for instructions on how to enter the Configuration Menu to change this setting.)

# Hardware Options

### Print Density

This function makes it possible to adjust the energy level of the printhead to darken the printout. An adjustment should only be made when necessary. The factory setting is 100%.

**Warning:**  Choose an energy level no higher than necessary to achieve a dark printout.

Failure to observe this rule may result in a printer service call or voiding of the printer warranty. Consult your Axiohm technical support specialist if you have any questions.

### Maximum Power

This function makes it possible to match the printer to the wattage of the power supply. The 55 W power supply is standard, whereas the 75 W power supply enables the printer to optimize speed at higher dot coverage. (See "Configuring the Printer" for instructions on how to enter the Configuration Menu to change this setting.)

### Knife Option

This function makes it possible to set the Knife Option if it is installed in the printer. This setting should only be changed if the option is added or removed.

### Paper Low Sensor

Paper Low Sensor setting makes it possible to enable or disable the paper low sensor for particular printer configurations.

### Printhead Resistance

The printhead in the thermal receipt printer can be one of two types. The printhead resistance setting must match the character (A or B) stamped on the heatsink in the back of the printhead. This character is visible by removing the top cover of the printer. Only a trained service representative may remove this cover. Therefore, under normal use this setting should be left at the factory default.

The printhead resistance settings are set by using the Configuration Menu. See "Configuring the Printer" for instructions on how to enter the Configuration Menu.

### MICR Option

This function makes it possible to set the MICR Option if it is installed in the printer. This setting should only be changed if the option is added or removed.

### Check Flip Option

This function makes it possible to set the Check Flip Option if it is installed in the printer. This setting should only be changed if the option is added or removed.

# Basic Troubleshooting

The A758 printer is a simple, generally trouble-free printer, but from time to time minor problems may occur. For example, the power supply may be disconnected or the thermal printhead may overheat.

The On Line, Paper Status, Error LED on the operator panel may signal that something is wrong. The light on the front right side of the printer is used only to indicate when a form is inserted properly. It does not indicate an error.

For some problems, the printer communicates the information to the host computer and relies on the application to indicate what the problem is.

The information on the following pages describes some problems that you may encounter: problems that you can easily fix, and others that you will need to contact a service representative for.

You may be able to correct many of the conditions or problems without calling for service. However, if a problem persists, contact a service representative. See "Contacting a Service Representative" at the end of this chapter.

If something is wrong with the printer, take the following general steps:

♦   Cycle the power of the printer and note its behavior.

♦   Check the On Line, Paper Status, Error LED and compare its behavior to the table below.

| Status | LED Behavior |
|---|---|
| Power Off | Off |
| Firmware Download | Fast Blink |
| Level 0 Diagnostics (entered at power on or in reset) | Fast Blink |
| Paper Low<br>Temperature Error<br>Voltage Error | Slow Blink |
| Cover Open (receipt, slip or flip)<br>Paper Out<br>Carriage Jam<br>Slip Jam<br>Flip Jam<br>Knife Jam | Fast Blink |
| All other states | On |

♦   Test the receipt printer or slip printer by printing a sample test print as described elsewhere in this document.

♦   Determine if the problem is with the thermal receipt printer or the impact slip printer and refer to the tables on the following pages.

## Printer Beeps

| Problem/Symptom | Possible Causes | What to Do |
| --- | --- | --- |
| Printer beeps in a single, double, or triple pattern at first power on, the On Line, Paper Status, Error LED blinks in the same pattern, and the printer won't power up. | The printer has a problem with its electronics. | Contact a service representative. |
| Printer beeps during normal operation. | The printer may be programmed to beep during normal operation by the software application used on the host computer. | Consult your application software manual. |

## Printer Will Not Print

| Problem/Symptom | Possible Causes | What to Do |
|---|---|---|
| The On Line, Paper Status, Error LED is blinking and the printer won't print. | The receipt paper may be out, the cover open, the knife jammed, the supply voltage out of range, or the printhead temperature out of range. | Check that the receipt paper is properly loaded and covers are closed. See the table at the beginning of this section. For problems not user correctable, contact a service representative. |
| Printer doesn't have power (LED not on) | Power supply may be defective. | If the power supply is plugged in, but does not come on, you will need to order a new power supply. See "Media and Supplies" in this document. |
| Printer has power but doesn't print. | Cables may not be connected properly. | Check all cable connections. Check that the host computer and power supply are both on (the power supply is turned on by plugging it into an outlet). See "Connecting the Cables" in this document. |
| | DIP Switches not set correctly. | Check the switch setting. DIP Switch one should be off (down) for normal operation. |
| | All other causes. | Contact a service representative. |

## On-Line, Paper Status, Error LED Flashes

| Problem/Symptom | Possible Causes | What to Do |
| --- | --- | --- |
| On Line, Paper Status, Error LED is blinking. | Receipt paper is out. Change the paper now. Do not run a transaction without paper as the data may be lost. | Change the paper immediately. See "Loading and Changing the Receipt Paper" in the *Owner's Guide*. |
| | Receipt, front or flip cover is open. | Close the cover. The printer will not operate with any of the covers open. |
| | The knife is jammed. | Open the receipt cover and check the knife. Clear any jammed paper you can see. Tear off any excess paper against the tear-off blade. |
| | The slip is jammed. | Open the Front Cover and clear paper from path. |
| | The carriage is jammed. | Open Front Cover and clear paper from path. |
| | A jam during flip. | If visible through Front Window, open access door and clear paper jam, if not, open Front Cover and clear jam. |
| | Receipt paper is low. | There are about 4.5 meters, ± 3 meters, (15 feet, ± 10 feet) of paper left. Change the paper soon to avoid running out of paper part way through a transaction. See "Loading and Changing the Receipt Paper" in this document. |
| | AC supply voltage is out of range. | If paper is not low and no conditions indicate that the thermal printhead is too hot, then it is likely that the power supply voltage is out of range. Contact a service representative. |

Continued…

| | | |
|---|---|---|
| On Line, Paper Status, Error LED is blinking. | Thermal printhead temperature is out of range. | The printhead may overheat when printing in a room where the temperature is above the recommended operating temperature or when printing high density graphics continuously, regardless of the room temperature. In either case, the printer will shut off. If the temperature of the printhead is too hot, adjust the room temperature or move the printer to a cooler location. If the printhead is overheating because of printing high density graphics continuously, reduce the demand on the printer. |

## Poor Forms Print Quality

| Problem/Symptom | Possible Causes | What to Do |
|---|---|---|
| Printer starts to print, but stops while the form is being printed. | Communication error or software error. | Check the interface cable. Check that the software is working properly. |
| Forms print is light or spotty. | Form not inserted incorrectly. | See "Printing on Forms or Checks" in this document. |
| | Impact printhead is dirty or defective. | Contact a service representative. |
| | Improper internal cable connections. | Contact a service representative. |
| Ribbon cassette is worn. | Replace the ribbon cassette. | See "Replacing the Ribbon Cassette" in this document. |
| Light print, smudging, or slip skews. | Platen gap needs adjustment. | Contact a service representative. |

## Poor Receipt Print Quality

| Problem/Symptom | Possible Causes | What to Do |
| --- | --- | --- |
| Colored stripe on receipt. | Paper is low. | Change the paper. |
| Receipt does not come out all the way. | Paper is jammed. | Open the receipt cover, inspect the knife, and clear any jammed paper. |
| Printer starts to print, but stops while the receipt is being printed. | Paper is jammed. | Open the receipt cover, inspect the knife, and clear any jammed paper. |
| Print is light or spotty. | Paper roll loaded incorrectly. | Check that the paper is loaded properly. |
| | Thermal printhead is dirty. | Use recommended thermal receipt paper. Clean the thermal printhead with an alcohol pen. Do not spray the thermal printhead with household cleaner as this may damage it and the electronics. The thermal printhead does not normally require cleaning if the recommended paper grades are used. If non-recommended paper has been used for an extended period of time, cleaning the printhead with an alcohol pen will not be of much benefit. |
| | Improper internal cable connections. | Contact a service representative. |
| | Printhead is defective. | Contact a service representative. |
| Vertical column of print is missing, one side of receipt is missing, or top or bottom half of characters are missing. | Printhead is defective. | Contact a service representative. |
| Print cassette ribbon jams when check flip option is used. | Improper ribbon cassette. An approved Axiohm cassette must be used with the check flip option. | Replace cassette with a cassette approved for the check flip option. |

## Slip Station, MICR and Flip Problems

| Problem/Symptom | Possible Causes | What to Do |
|---|---|---|
| Slip Table LED does not come on. | Form or check not inserted properly. | Line up the form or check against the Check Guide (wall) and slide it toward the back of the printer until it contacts the Form Stop and can't go any further. Extra long forms may need to be inserted from the side to disengage the Form Stop. See "Printing on Forms or Checks" or "Validating and Verifying Checks" in this document. |
| Forms or checks skew or catch in the slip station. | There is an obstruction or paper jam in the slip station. | Open the front cover and check for any paper jams or obvious obstruction in the slip station. Clear the obstruction or jammed paper. |
| The optional check flip mechanism doesn't work. | There is an obstruction or paper jam in the check flip mechanism. | See "Clearing Paper Jams" in this document. |
| The optional MICR (Magnetic Ink Character Recognition) check reader does not read or misreads checks. | The check is inserted improperly. | Make sure the check is inserted properly with the MICR characters down. See "Validating and Verifying Checks" in the *Owner's Guide*. |
| | The check is fraudulent. | Make sure that the check is not fraudulent. On fraudulent checks, the characters the printer reads may be different from those that are visible on the check face. |
| | A nearby magnetic source is interfering with the check reader. | Devices, such as CRT monitors, security devices or large metal surfaces that are near the printer can affect the printer's magnetic field, causing intermittent reading errors when the MICR check reader is in operation. Move the printer away from such items or areas. |
| Print cassette ribbon jams when check flip options is used. | Improper ribbon cassette. Approved Axiohm cassette must be used with the check flip option. | Replace cassette with a cassette approved for the check flip option. |

## Knife Does Not Operate

| Problem/Symptom | Possible Causes | What To Do |
| --- | --- | --- |
| Receipt is not cut. | Paper is jammed. | Open the receipt cover, inspect the knife, and clear any jammed paper. |
| | The printer has a knife but the firmware is not configured for a knife. | Enable the knife option by reconfiguring the printer. See "Configuring the Printer" in this document. |
| | All other problems. | Contact a service representative. |

# Other Serious Problems

The following problems all need to be corrected by a qualified service representative. See the next section, "Contacting a Service Representative."

♦   MICR check reader not operating properly

♦   Forms not feeding into the slip/forms area properly

♦   Missing dots in slip or forms printing

♦   Printer will not cycle or stop when required

♦   Illegible characters

♦   Paper will not feed

♦   Knife will not cycle or cut

♦   Platen will not open or close

♦   Printer will not communicate with the host computer

# Contacting a Service Representative

For serious problems, such as the printer not printing, not communicating with the host computer, or not turning on, contact Axiohm technical support at 607-274-2424.

For self-maintenance organizations, a service guide, service video, parts manual, and other service documents, can be obtained from Axiohm.

# Returning a Printer

Follow these instructions if you need to return a printer for servicing.

1. If you are sending the printer to Axiohm for repair, call Axiohm for a Return Material Authorization number (RMA#) at (607) 274-4777. Be prepared to answer questions concerning shipping and billing. Request an RMA process be sent to you, if required.

2. Pack the printer as follows:
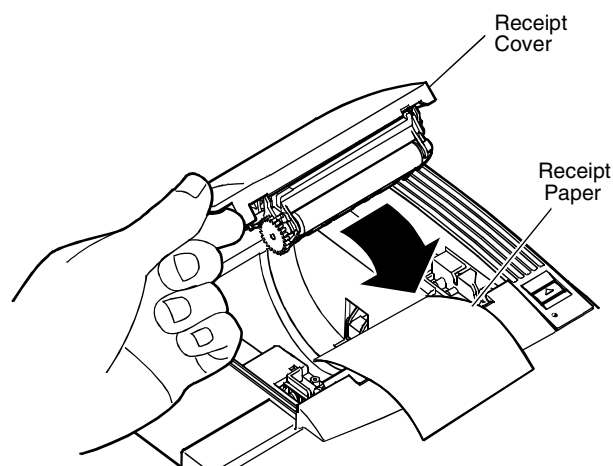


   a. Place receipt paper between the receipt cover and the printhead for protection.
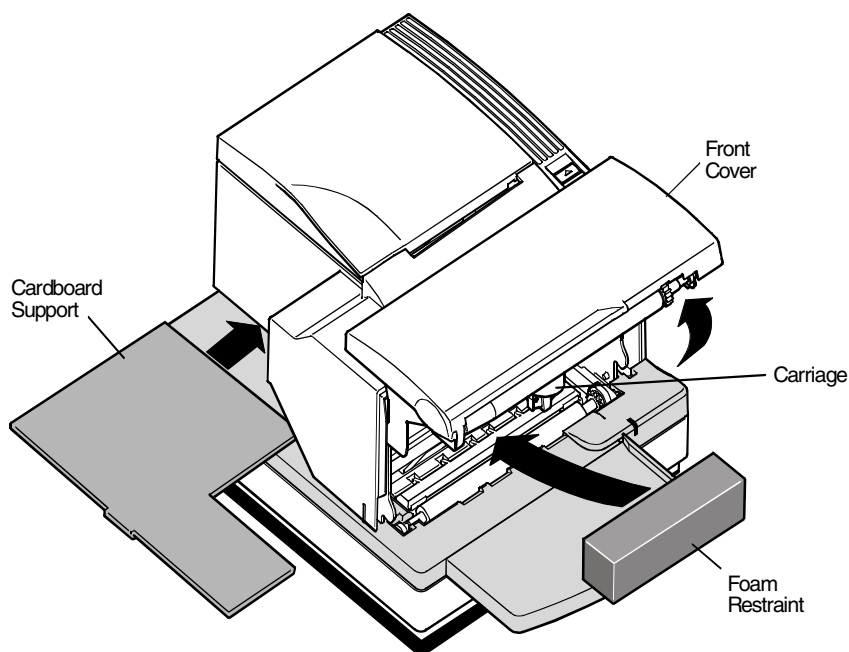


   b. Remove the ribbon cassette, move the carriage to the right, and place the foam restraint between the left side of the printer and the carriage to protect the carriage.

   c. Place the cardboard support on the Slip Table.

    d.   Place the printer in the plastic bag and foam pack, place the packed printer in the box and secure the box with packing tape.

3.   Write the RMA# on the outside of the box and send the printer to the following address, according to the RMA process:

Axiohm
950 Danby Road
Ithaca, NY 14850
U.S.A.

RMA # 907456 (sample number for example only)

# Chapter 4: Printer Media & Supplies

- ◆ **Ordering Thermal Paper**

- ◆ **Ordering Parts and Supplies**

# Ordering Thermal Paper

## Thermal Paper Specifications

The printer requires qualified thermal paper with the following dimensions:

| Width | Diameter | Length |
|---|---|---|
| 80 mm + .2 mm - .6 mm (3.15 + .008 in. - .024 in.) | 90 mm max. (3.54 in.) | 98 meters (322 ft.) 2.4 mil thick 73.5 meters (241 ft.) 3.2 mil thick |

The paper must not be attached at the core. Use paper with a colored stripe at the end to indicate that the paper is running low.

The above lengths are based on a core diameter of 22 ± .5 mm (.87 in.) outside, 11.5 ± .5 mm (.45 in.) inside.

## Manufacturers

Axiohm recommends the following paper grades produced by the respective manufacturers. There are a number of paper converters qualified to provide this paper, provided the POS rolls are from these recommended grades.

| Qualified Manufacturers | Phone | Paper Grade (Density) |
|---|---|---|
| Appleton Papers, Inc. (USA) 825 E Wisconsin Ave. Appleton, WI 54912 | Voice: 800-922-1729 Voice: 920-734-9841 Fax: 800-922-1712 | Optima T1030 (Light) Optima T1012A (Standard) Optima T1062A-16 (Standard) Optima Superior (Standard) |
| Kanzaki Specialty Papers (USA) 20 Cummings St. Ware, MA 01082-2002 | Voice: 888-526-9254 Voice: 413-736-3216 Fax: 413-731-8864 | P-300 (Light) P-310 (Standard) P-350 (Standard) P-354 (Standard) TO-260 (Standard) TO-282 (Standard) TO-381L (Standard) |
| Jujo Thermal LTD. P.O. Box 92 FIN-27501 Kauttua, Finland | Voice: 358-38-393-2900 Fax: 358-38-393-2419 | AF50KS-E3 (Standard) AP62KS-E3 (Standard) |

Additional grades are qualified and available for special media requirements.

Axiohm can provide paper in small lots to facilitate product evaluation and testing.

To order paper rolls directly from Axiohm, use the following part numbers:

| Standard Density | 50 Rolls, 90mm dia. | Axiohm #A152-0034 |
|---|---|---|
| Light Density | 50 Rolls, 90mm dia. | Axiohm #A152-0035 |

# Ordering Parts and Supplies

## Ordering Cash Drawers

Order cash drawers from the following suppliers:

| Cash Drawers | Number |
| --- | --- |
| NCR | 7052-K657 |
| M-S Cash Drawer Corp. | EP-125 K series, EP-127, EP-102 |
| APG Cash Drawer | Model 322 |
| Indiana Cash Drawer | Model SLD |

## Ordering Power Supply Cord and Adapters

Contact your sales representative to order the power supply and power cords listed in the table. The numbers are for Axiohm reference only. Suppliers may use other numbers.

| Item | Type | Number |
| --- | --- | --- |
| Power supply (55 watt) with attached cable to printer and U.S. power supply cord | | A758-K330 |
| Power supply (75 watt) with attached cable to printer and U.S. power supply cord | | A758-K331 |
| Power supply (55 watt) attached cable | | A758-K301 |
| Power supply (75 watt) attached cable | | A758-K302 |
| Power supply cord (to outlet) | United States | A758-K320 |
| | International (no plug) | A758-K321 |
| | United Kingdom | A758-K322 |
| | S.E.V. | A758-K323 |
| | Australia | A758-K324 |
| | International (with plug) | A758-K326 |
| 6-pin female to 3-pin male power adapter | | A758-K303 |
| 3-pin female to 6-pin male power adapter | | A758-K304 |
| Power supply mounting bracket | | A758-K309 |

## Ordering Communication Cables

Contact your sales representative to order the communication cables listed in the table. The numbers are for reference only. Suppliers may use other numbers.

| Communication Cables | Length | Order Number |
|---|---|---|
| RS-232C 25-pin male (printer) to 9 pin female (host) | (2 meters—6.6 ft.) | A141-0005 |
| RS-232C 25-pin male (printer) to 9 pin female (host) | (6 meters—19.7 ft.) | A141-0006 |
| RS-232C 25-pin female (host) to 9-pin female (printer) | (3 meters—9.8 ft.) | A141-0008 |
| RS-232C 9-pin female (host) to 9-pin female (host) | (3 meters—9.8 ft.) | A141-0007 |
| IEEE-1284 Parallel 25-pin (male) to 25-pin (male) | (3 meters—9.8 ft.) | A141-0009 |

## Forms Specifications

The A758 prints on single- or multiple-part forms in the slip station (up to five-part forms). Forms and slips must meet the following requirements:

♦ Front insertion (minimum):
   51 mm (2.00 inches) wide
   68 mm (2.68 inches) long

♦ Side insertion (minimum):
   203 mm (8.0 inches) wide
   51 mm (2.0 inches) long

♦ Single-ply forms should be on paper that is greater than 15 pounds

♦ Multiple-part forms (up to five parts) should be no thicker than .40 mm (.016 inches) and a minimum thickness of .08 mm (.003 inches).

Important: Do not use forms containing holes along the top or right edge.

♦ Forms for use with Flip Check (minimum)
   51 mm (2.00 inches) wide
   70 mm (2.75 inches) long

## Check Specifications

Check specifications for paper are defined by American Standards ANSI X9.13 and ANSI X9.18, and International Standard ISO 1004.

♦ Minimum check size: 70 mm (2.75 in.) wide x 152 mm (6.00 in.) long

♦ Maximum check size: 95 mm (3.75 in.) wide x 222 mm (8.75 in.) long

## Ordering Ribbon Cassettes

To order ribbon cassettes, contact your sales representative or order from Axiohm at the following address or toll free number:

**Axiohm**
950 Danby Road
Ithaca, NY 14850
Voice: 1 (607) 274-2424
           (607) 274-2500 (Customer Services)

**Stock Numbers:**

A152-0004 (purple ribbon cassette—3 million character life) – Qty. 12
A152-0005 (black ribbon cassette—3 million character life) – Qty. 12
A152-0011 (purple long life ribbon cassette—5 million character life)
           – Qty. 12
A152-0012 (black long life ribbon cassette—5 million character life) – Qty. 12

## Ordering Extended Slip Tables

Contact a sales representative to order slip tables. The numbers listed below are for reference only. Suppliers may use other numbers.

| | |
|---|---|
| Extended Slip Table (Standard) | A758-K280 |
| Extended Slip Table (Short) | A758-K281 |

## Ordering Documentation

Contact a sales representative to order the following documentation:

| Item | Number |
|---|---|
| A758 Owner's Guide | A758-D100 |
| A758 Service Guide | A758-D200 |
| Field Service Video for A758 Printer | A758-D400 |

# Chapter 5: Technical Specifications

- **Functional Description**

- **Reliability**

- **Certifications**

- **Physical and Operating Environment**

- **Migration**

- **Performance Requirements**

- **Interface Description**

- **Dimensions and Weight**

# Functional Description

## Standard Slip Features

| | |
|---|---|
| **Print Technology** | Bidirectional, logic-seeking, nine wire impact printhead |
| **Printhead Features** | Automatic homing and jam detection |
| **Ink Means** | 3 or 5 million character life<br>Carriage mounted ribbon cassette |
| **Print Resolution** | Standard  139 DPI X 72 DPI<br>Compressed  171 DPI X 72 DPI |
| **Character Cell** | 10 Half Dots x 7 Dots High |
| **Print Line Width** | Standard  66 characters @ 13.9 CPI<br>Compressed  80 characters @ 17.1 CPI |
| **Enhanced Print** | Double wide and rotated character<br>Double strike to improve contrast |
| **Print Line Spacing** | Standard  7.2 lines/inch |
| **Print Line Rate** | Full 40 columns at 290 LPM @ 13.9 CPI |
| **Paper Feed** | Bi-directional, 4.6 IPS, maximum |
| **Forms Handling** | Horizontal Slip Table<br>Retractable slip stop<br>Front/side insertion |
| **Forms Capability**<br>* See notes on the following page. | Maximum thickness .40 mm (.016 inch) max., 5 plies<br>Minimum .08 mm (.003 inch)<br>Minimum Form Reflectivity 60%<br><br>Minimum Length:  68 mm (2.68 inches) w/o check flip option<br>70 mm (2.75 inches) with flip option<br><br>Minimum Width:   51 mm (2.00 inches)<br><br>[Ensures that forms cover both the optical slip detectors and expose about one inch of the form to push in place.] |
| **Forms Detection** | Leading edge sensor at forms stop<br>Trailing edge sensor in right margin. |

| | |
|---|---|
| **Indicators** | Green LED "Slip-in" light |

| | |
|---|---|
| **Character Sets** | PC Code Page 437 |
| | PC Code Page 850 |
| | PC Code Page 852 |
| | PC Code Page 858 |
| | PC Code Page 860 |
| | PC Code Page 863 |
| | PC Code Page 865 |
| | PC Code Page 866 resident |
| | Additional Flash memory for user-defined characters |

| | |
|---|---|
| **Graphics** | 139 DPI X 72 DPI bit-mapped, input as 7 and 8 dot high unidirectional print lines. |

| | |
|---|---|
| **Bar Code Fonts** | UPC-A |
| | UPC-E |
| | JAN8 |
| | JAN13 (EAN) |
| | Code 39 |
| | Interleaved 2 of 5 |
| | Codabar |
| | Code 128 |
| | Code 93 |

## Slip Forms - Recommendations

♦  The slip form should be flat and void of curls or wrinkles, especially at the top.
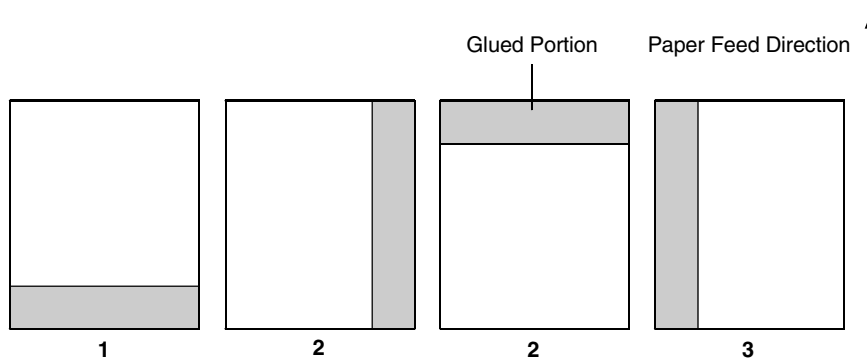


♦  Considerations for glued edges on slip paper:

1.  No glue on bottom edge.

2.  Right or top edge:  Paper feeding and insertion affected by gluing method, length of edge, and quality of glue used.

3.  Left edge or wide slip paper:  Skewing may occur.

Slip                MICR
Sensor              Head

Slip/LED
Sensor

Slip Side
Guide

19 mm
(0.747 in.)

8 mm
(0.315 in.)

6 mm
(0.236 in.)

Slip
Edge

Paper Feed
Direction

Paper Holes and
Low Reflection
Prohibited Areas

B        A
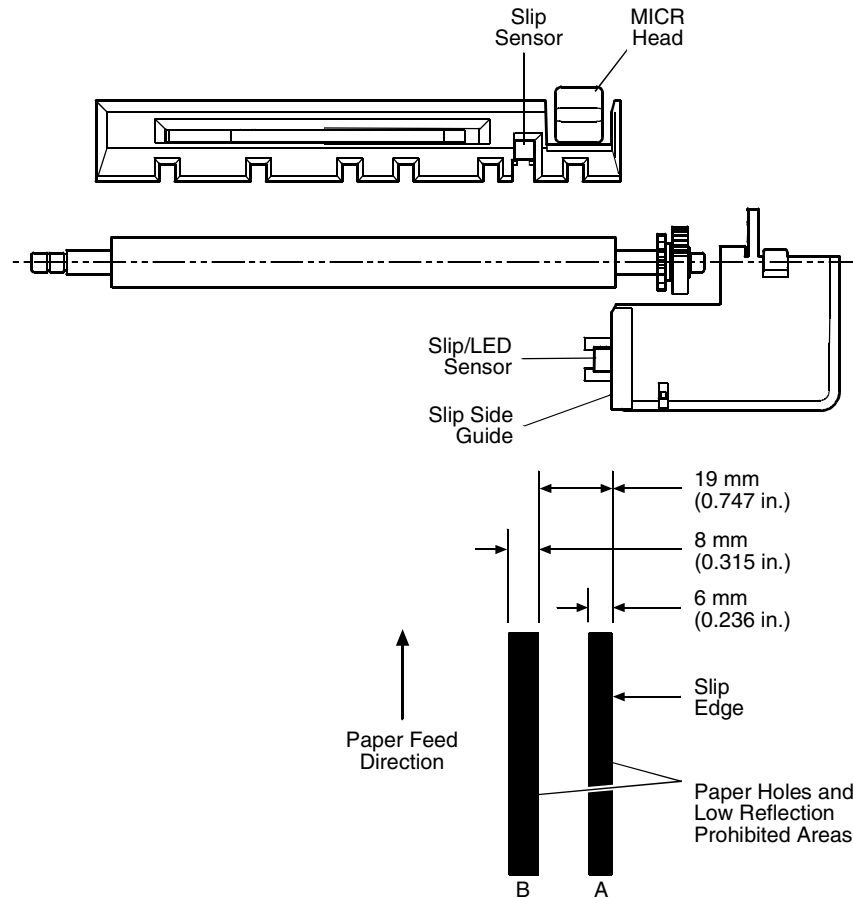
The Slip/LED Sensors use a reflective photo sensor.

♦   Do not use paper that has holes or is translucent at the Slip/LED Sensor
    location. (See "A" in above illustration.)

♦   Do not use paper that has holes on dark areas with low reflection (less than
    60% reflection) at the Slip Sensor location. (See "B" in above illustration.)

♦   Thin paper should be used between the top and bottom sheets of multi-ply
    paper. Thick paper reduces the copy capability.

## MICR Reader – Additional Information

♦   The check must be flat and void of curls, folds, or wrinkles (especially at the
    edges). Wrinkled checks may rub against the ribbon causing them to become
    ink-stained.

♦   Checks must be void of clips or staples. Paper jams, MICR read errors,
    and/or MICR head damage could occur.

♦   Immediately release the check once the printer starts to feed it. Failure to
    release the check could skew it, causing paper jams and MICR read errors.

## Standard Receipt Features

| | |
|---|---|
| **Print Technology** | Direct thermal<br>640 dot printhead |
| **Print Resolution** | 203 DPI horizontal and vertical<br>8 dots/mm |
| **Character Cell** | Standard 13 X 24<br>Compressed 10 X 24 |
| **Print Width** | Standard 44 characters @ 15.6 CPI<br>Compressed 56 characters @ 20.3 CPI |
| **Enhanced Print** | Double Wide, Double High, Rotated, Underlined, Scalable, Italic, Superscript, Subscript, Bold, and Reversed Image characters |
| **Print Line Spacing** | 7.52 lines/inch, standard |
| **Print Line Rate** | 38.4 LPS for text at standard spacing.  See Receipt Throughput |
| **Paper Feed** | Unidirectional, 130mm/second maximum.  See Receipt Throughput |
| **Paper Sensing** | Paper exhaust switch<br>Paper low switch (adjustable). |
| **Operator Interface** | Paper Feed Button on cabinet |

**Character Sets**        PC Code Page 437
                          PC Code Page 850
                          PC Code Page 852
                          PC Code Page 858
                          PC Code Page 860
                          PC Code Page 863
                          PC Code Page 865
                          PC Code Page 866 resident
                          Additional Flash memory for user-defined characters

**Graphics**              203 DPI X 203 DPI bit-mapped, input as 24 dot high print lines

**Bar Code Fonts**        UPC-A
                          UPC-E
                          JAN8
                          JAN13 (EAN)
                          Code 39
                          Interleaved 2 of 5
                          Codabar
                          Code 128
                          PDF-417 Two-dimensional Code
                          Code 93

## Optional Features

| | |
|---|---|
| **Paper Cutter** | Rotary partial cut knife leaves 5.0 mm (0.2 inch) uncut on left edge. |
| **Slip Table Kits** | Extends Slip Table 38 mm (1.5 inches) (shortened) or 76 mm (3.0 inches) (standard) in front (standard on MICR and flip). |
| **MICR Reader** | Integrated into the slip station.<br>Reads MICR checks oriented for validation on the back of the check, and communicates the character string to the host computer.<br>Reads E13B and CMC7 MICR Fonts (Auto discriminates). |
| **Check Flip** | Error and fraud prevention feature.<br>Turns validated checks over for printing on the face of the check. |
| **Remote Power Supply** | 55W standard<br>75W available<br>Auto-Ranging input<br>24Vdc output |
| **Interface daughter PCB's** | RS232, 9 pin connector<br>RS232, 25 pin connector<br>Parallel |

# Reliability

The numbers in the table refer to the Mean Cycles Between Failure (MCBF) for the items indicated.

| | |
|---|---|
| **Thermal Receipt Printer** | 45 Million Lines |
| **Impact Slip Printer** | 15 Million Lines |
| **Impact Printhead** | 200 Million Characters |
| **Knife** | 1.5 Million Cuts |
| **MICR Check Reader** | 200,000 Reads |
| **Ribbon Cassette** | 3 or 5 Million Characters |
| **Check Flip** | 200,000 Flips |

# Certifications

## EMI:

♦ FCC, Class A

♦ Industry Canada, Class A

♦ VCCI, Class A

♦ CE Mark, Class B

♦ Austel, Class B

## Safety:

♦ UL 1950

♦ CSA 22.2 No. 950

♦ CE Mark (EN60950)

# Physical and Operating Environment

## Temperature and Humidity

| | Temperature in Degrees | %Humidity |
|---|---|---|
| **Operating:  w/ Knife** | 5C to 28C ( 41F to   82F) | 10 to 90 |
| | 28C to 45C ( 82F to 113F) | 10 to 35 |
| **Operating:  w/o Knife** | 5C to 35C ( 41F to   95F) | 5 to 90 |
| | 35C to 50C ( 95F to 122F) | 5 to 40 |
| **Storage:** | -10C to 50C ( 14F to 122F) | 5 to 90 |
| **Transit:** | -40C to 60C (-40F to 140F) | 5 to 95 |

## Electrical

The A758 printer complies with the regulatory EMI standards and levels indicated in the section on Certifications when tested as a stand-alone unit.

When connected to a host terminal or system, the A758 also complies with these standards and levels, provided that the host terminal or system first complies without the A758 printer connected.

## Slip Media

The A758 prints 1 to 5 part forms with the following limitations:

♦ The minimum thickness of a single part form is .08 mm (.003 inch).

♦ If present in a multi-part form, cardstock will be the bottom part.

♦ Maximum total thickness is .40 mm (.016 inch).

♦ Minimum form reflectivity is 60%

Minimum form length (feed direction) for forms inserted from the front up to the slip stop is 68 mm (2.68 inches) w/o check flip option and 70 mm (2.75 inches) w/Flip option. Minimum form width (print direction) is 51 mm (2.00 inches). These minimums ensure the form covers both optical slip detectors, and expose about one inch of the form to push in place.

The form must be at least 127 mm (5.00 inches) wide to print all 66 standard or 80 compressed columns. Large forms may be inserted from the left side and override the slip stop. Forms over 170 mm (6.70 inches) wide will extended outside the left side of the printer.

## Receipt Media

♦ Direct thermal paper, with or without environmental coating.

♦ Paper thickness range:          51–86 µm (2.0–3.4 mil).

♦ Receipt roll width:             80 + .2 - .6 mm (3.150 + .008 - .024 inch).

♦ Receipt roll diameter:          90 mm (3.54 inch) maximum.

♦ Receipt roll capacity: *        98M (322 feet) of 61µm (2.4 mil) thick paper
                                  73.5M (241 feet) of 81µm (3.2 mil) thick paper

♦ Roll construction:              Image side facing out.

♦ End-of-roll warning:            Stripe recommended, not required.

* Based on core diameter of:      22 ± .5 mm (.87 inch) outside,
                                  11.5 ± .5 mm (.45 inch) inside.

# Migration

The A758's standard command set allows it to work with software written for Axiohm or other ESC/POS™ compliant printers.

The A758 supports two modes of operation: "A756 emulation" and "A758 native" modes. When the A758 is configured for A756 emulation mode through the Configuration Menu, the printer is backward compatible to A756 slip and receipt applications (no journal) except that receipt print resolution is increased from 6 to 8 dots/mm. If the 6 to 8 dot/mm conversion feature is not used, this will result in the size of graphics being reduced by 25%.

See Chapter 7: Programming Guide for a comparison to the A756.

# Performance Requirements

## Slip Printing

### Slip Positioning

Forms are inserted from the front, top-of-form first, up to a form stop behind the carriage, or inserted from the left side and over-ride the form stop.  In each case the form must be aligned with the check guide (right edge of the slip path).  A pair of optical sensors are located (a) 11 mm (.45 inch) above the print centerline and 25 mm (1.00 inch) from the check guide, and (b) just inside the check guide and 37 mm (1.45 inches) below the print centerline.  The application can use these for form-in and trailing edge detection. A green slip-in LED indicates when both detectors are covered.

The application moves the form bi-directionally in 1/72-inch increments to position the first line of print.

### Slip Format

Maximum print line width: 120.7 mm  (4.752 inches) starting 3.20 mm ± 1.5 mm (.125 inch ± .060 inch) from the right edge of the form.

|                      | Standard Font         | Compressed Font       |
| -------------------- | --------------------- | --------------------- |
| Character Cell       | 10 half dots x 7 dots | 10 half dots x 7 dots |
| Character Size       | 7 x 7                 | 7 x 7                 |
| Character Per Line   | 66 @ 13.9 CPI         | 80 @ 17.1 CPI         |
| Graphics Capability  | 330 full dots         | N/A                   |
|                      | 660 half dots         | N/A                   |

Print line height: 7 dots @ 1/72 inch + Extra Dot Rows:

| | | |
|---|---|---|
| 0 EDR between lines: | 2.47 mm (.097 inch) ±5% | = 10.3 LPI |
| 1 EDR: | 2.82 mm (.111 inch) ±5% | =  9.0 LPI |
| 2 EDR: | 3.18 mm (.125 inch) ±5% | =  8.0 LPI |
| 3 EDR (standard): | 3.53 mm (.139 inch) ±5% | =  7.2 LPI |
| 4 EDR: | 3.88 mm (.153 inch) ±5% | =  6.5 LPI |
| 5 EDR: | 4.23 mm (.167 inch) ±5% | =  6.0 LPI |
| N EDR: | $(7+N)/72$ in. ±5% | |

Minimum top margin (form against form stop):            16.0 mm (.63 inch)

Minimum top margin (after reverse feeding):             5.0 mm (.20 inch)

Minimum bottom margin:                                  15.0 mm (.59 inch)

## Slip Throughput

Bi-directional line speed is based on a printhead speed of 260 CPS. Throughput (±5%) at the standard line spacing (7.2 LPI) depends on line length expressed in characters:

| Line Length | Character Density | Lines Per Minute |
|-------------|-------------------|------------------|
| 40 Chars. | 13.9 CPI (standard) | 290 LPM |
| 52 Chars. | 13.9 CPI (standard) | 237 LPM |
| 66 Chars. | 13.9 CPI (standard) | 195 LPM |
| 80 Chars. | 17.1 CPI (compressed) | 166 LPM |

Unidirectional (graphics) line speed, will be half the above throughput.

Minimum form width for full width print = 127 mm (5.00 in.)

Printable Zone, 330 Full Dots = 120.7 mm (4.752 in.)

Nominal Margins = 3.2 mm (0.125 in.)

**Top Edge**

Minimum with Slip Stop 16.0 mm (0.630 in.)

```
ABCDE...................................67890
ABCDE...................................67890
ABCDE...................................67890
.
.
ABCDE...................................67890
```

Minimum 15.0 mm (0.59 in.)

**Trailing Edge**
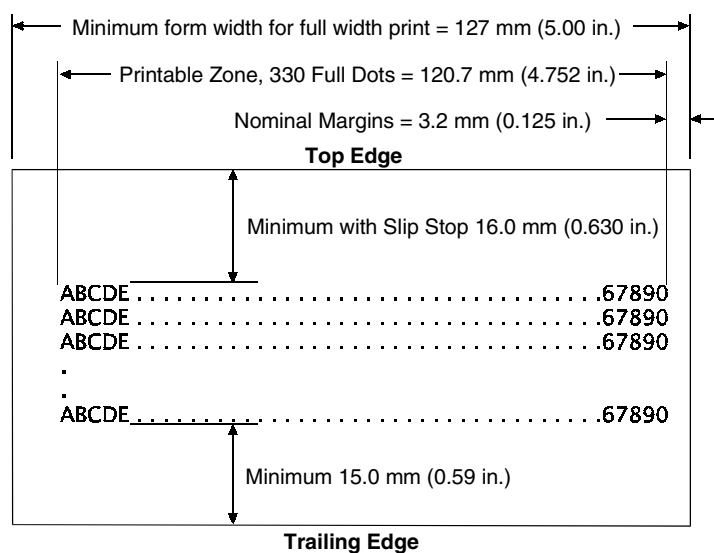
# Character Format

The A758 can place 66 standard characters, or 80 compressed characters, or 33 rotated characters, or 330 adjacent bits of graphics (660 addressable positions) in the 121 mm (4.752 inch) wide print zone.  Minimum line height is 7 dots (.097 inch) for vertical print or graphics, and 6 dots (.083 inch) for rotated print.



**Double Wide**

**Next Line**

\* Extra Dot Rows
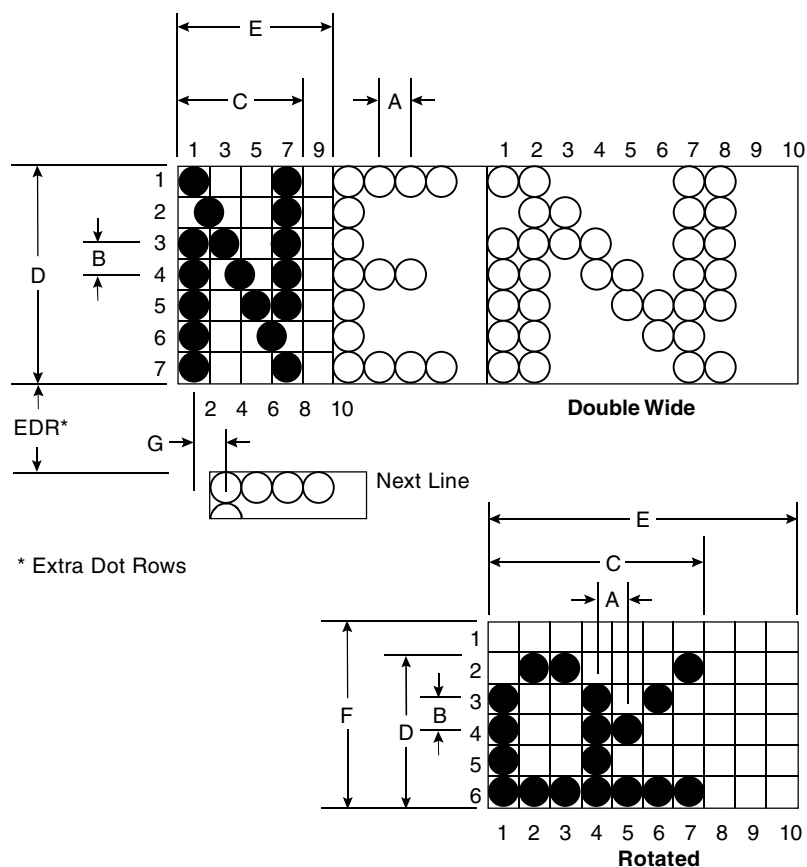
**Rotated**

| Dimension | Standard | | Compressed | | Rotated | |
|---|---|---|---|---|---|---|
| | mm | inch | mm | inch | mm | inch |
| A | .36 | .0144 | .30 | .0117 | .36 | .0144 |
| B | .35 | .0139 | .35 | .0139 | .35 | .0139 |
| C | 1.46 | .0576 | 1.19 | .0468 | 2.56 | .1008 |
| D | 2.47 | .0973 | 2.47 | .0973 | 1.76 | . 0695 |
| E | 1.83 | .0720 | 1.48 | .0585 | 3.66 | .1440 |
| F | N/A | N/A | N/A | N/A | 2.11 | .0834 |
| G | .35 Max. | .014 Max. | .35 Max. | .014 Max. | .35 Max. | .014" Max. |

### Allowable Duty Cycle (measured over one minute of continuous printing)

The impact printhead can continuously print the following average number of characters over a one minute period.

| Ambient Temperature in degrees: | 5C | 20C | 35C | 50C |
|---|---|---|---|---|
| 11.5 Dots/Char. avg.: | 7200CH | 6000CH | 4800CH | 3600CH |
| 15.0 Dots/Char. avg.: | 5700CH | 4800CH | 3900CH | 3000CH |
| 19.0 Dots/Char. avg.: | 4200CH | 3600CH | 3000CH | 2400CH |

No one print wire may exceed 18% of the dots printed.

### Ribbon Life

The snap-on purple and black ink ribbon cassettes are available in 3 and 5 million character cartridge lives.

## Receipt Printing

### Receipt Format, 80mm Paper Width

Print line width:  576 dots @ 8 dots/mm centered on 80 mm.

|  | Standard Font | Compressed Font |
|---|---|---|
| Character Cell | 13 x 24 dots | 10 x 24 dots |
| Character Per Line | 44 @ 15.6 CPI | 56 @ 20.3 CPI |
| Nominal Margins | 4.25 mm (.167 inch) | 5.00 mm (.200 inch) |
| Minimum Margins | 2.00 mm (.079 inch) | 2.50 mm (.098 inch) |

Print line height:   24 dots @ 8 dots/mm + Extra Dot Rows between lines

| | | |
|---|---|---|
| 0 EDR: | 3.00 mm (.118 inch) ±3% | = 8.47 LPI |
| 1 EDR: | 3.12 mm (.123 inch) ±3% | = 8.13 LPI |
| 2 EDR: | 3.25 mm (.128 inch) ±3% | = 7.81 LPI |
| 3 EDR (Standard): | 3.37 mm (.133 inch) ±3% | = 7.52 LPI |
| 4 EDR: | 3.50 mm (.138 inch) ±3% | = 7.25 LPI |
| 5 EDR: | 3.62 mm (.143 inch) ±3% | = 7.00 LPI |
| 10 EDR: | 4.25 mm (.167 inch) ±3% | = 5.98 LPI |
| N EDR: | (3 + N/8) mm ±3% | |

Top margin to manual tearoff: (non-Knife)          9.75 mm (.384 inch) minimum.

Top margin to knife cut:                                    17.80 mm (.700 inch) minimum.

**Print Zone**
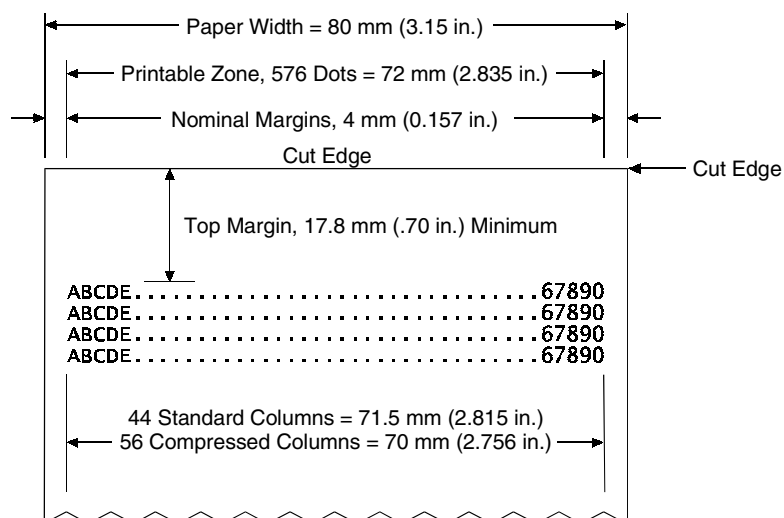


The application centers 44 standard character cells (13 X 24 dots), or 56 compressed character cells (10 X 24 dots), or 576 addressable bits of graphics across an 80 mm wide receipt.  Minimum print line height is 24 dots for text or graphics.  Standard print line spacing is 27 dots (i.e. 3 extra dot rows).

When printing graphics or logos, converted from 6 dot/mm to 8 dot/mm (i.e. designed for A756), the printable zone is expanded to 598 dots.
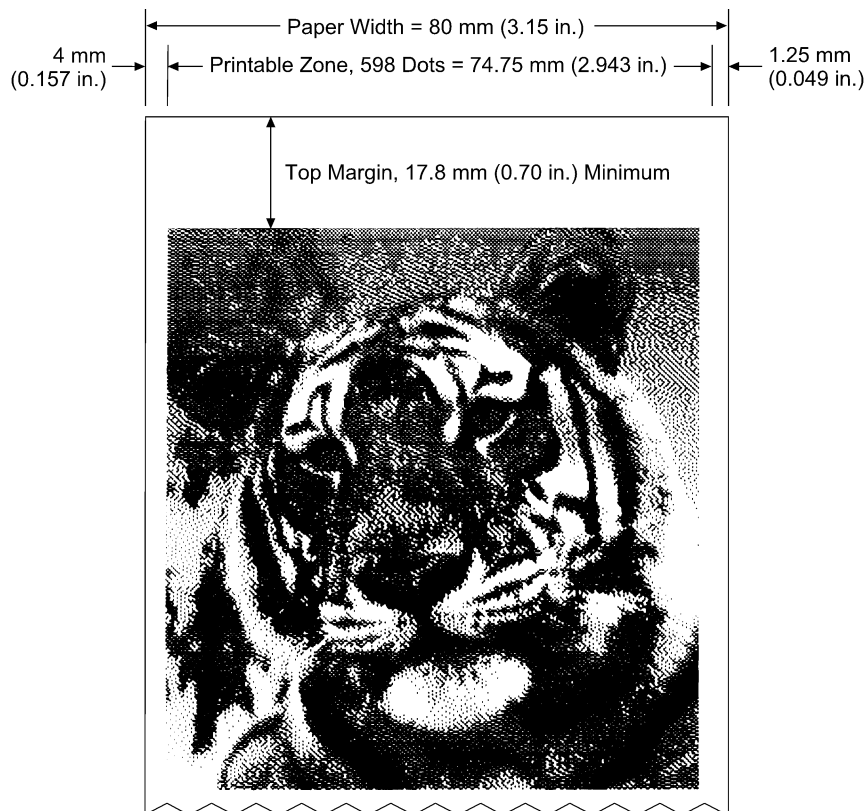
Character Pattern for Standard 15.6 CPI Pitch



B - Upper Case                Ö - With Ascender
m - Lower Case                $ - Both Ascender and Decsender
g - With Descender            ‡ - Graphic Symbol
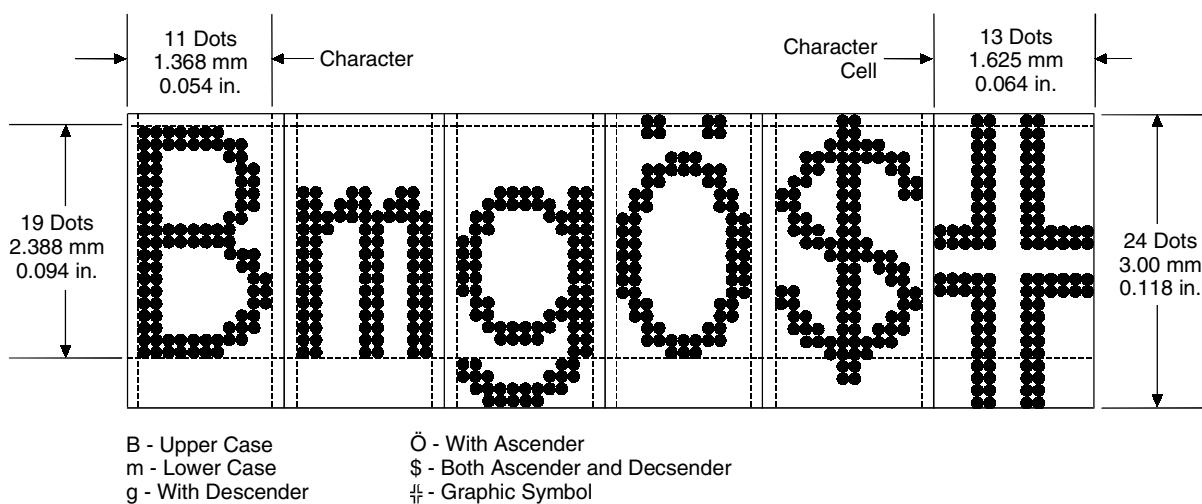
Character Pattern for Compressed 20.3 CPI Pitch



B - Upper Case                Ö - With Ascender
m - Lower Case                $ - Both Ascender and Decsender
g - With Descender            ‡ - Graphic Symbol
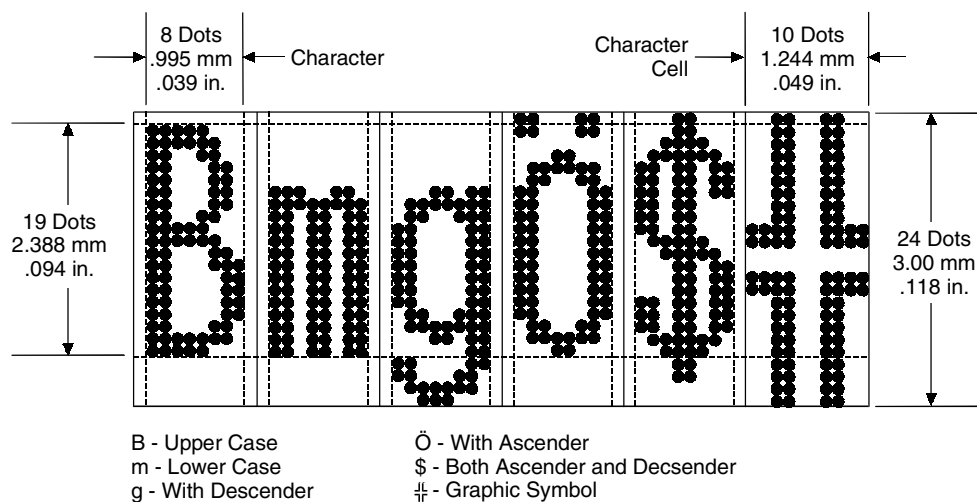
### Receipt Throughput:

Maximum throughput is achieved at any dot coverage up to 25%, which includes any amount of text. But above that, throughput is dependent on the dot coverage and available electrical power.

|  | 25% Dot Coverage (Max Speed) | 50% Dot Coverage and 75 W | 50% Dot Coverage and 55 W | 100% Dot Coverage and 75 W | 100% Dot Coverage and 55 W |
|---|---|---|---|---|---|
| **Dot line period:** | 0.95 ms | 0.95 ms | 1.33 ms | 2.05 ms | 3.3 ms |
| **Paper Speed:** | 130 mm/sec 5.1 IPS | 130 mm/sec 5.1 IPS | 94 mm/sec 3.7 IPS | 61 mm/sec 2.4 IPS | 38 mm/sec 1.5 IPS |
| **Throughput @ 8.13 LPI:** | 41.5 LPS | 41.5 LPS | 30.1 LPS | 19.5 LPS | 12.2 LPS |
| **Throughput @ 7.52 LPI:** | 38.4 LPS | 38.4 LPS | 27.8 LPS | 18.0 LPS | 11.3 LPS |
| **Throughput @ 5.98 LPI:** | 30.5 LPS | 30.5 LPS | 22.1 LPS | 14.4 LPS | 9.0 LPS |

**Note:** Standard receipt has approximately 12% dot coverage.
A full line of text is approximately 25% dot coverage.
Graphics are approximately 40% dot coverage.
Barcodes have approximately 50% dot coverage.
A solid black line is 100% dot coverage.

In order for an application to achieve the fastest throughput it must ensure that data arrives at the printer at least as fast as it is printed, so the printer will be able to print each line after the preceding line, without stopping to wait for more data. Ideally, an application will send all the data for an entire customer receipt without pausing between characters or lines transmitted.

### Allowable Duty Cycle (measured over one minute of continuous printing)

| Amount of Dot Coverage | Ambient Temperature | | |
|---|---|---|---|
|  | 25°C | 35°C | 50°C |
| **20%** | 100% | 50% | 20% |
| **40%** | 50% | 25% | 10% |
| **100%** | 20% | 10% | 4% |

### Partial Cut Knife

The "partial cut" produces a partial cut that leaves $5.0 \pm 1.5$ mm $(.20 \pm .06$ inch) paper remaining on the left edge.

**Receipt Paper Low:**

The paper low assembly lights the On Line, Paper Status, Error LED when the roll is almost exhausted. When the roller ball on the assembly slips into the hollow core of the paper roll, a microswitch opens and paper low is indicated. The customer can adjust the paper low assembly:

| Paper Low Setting | Amount of POS Paper Left |
|---|---|
| Factory setting | 15 ± 10 feet* |
| Turn screw 1 revolution clockwise | Decrease amount left by 5 feet. |
| Turn screw 1 revolution CCW | Increase amount left by 5 feet. |
| Turn screw all the way down CW | Paper low is disabled. |

\* The above lengths are based on a core diameter of 22 ± 0.5 mm (0.87 inch) outside, 11.5 ± 0.5 mm (0.45 inch) inside.

# Interface Description

## Human Interfaces

♦   Receipt Paper-loading Door, on top of the cabinet.  The receipt station will not print when this door is open.  See "Loading Receipt Paper".

♦   Ribbon Cassette-loading Door, in front of the cabinet.  The slip station will not print when this door is open.  See "Putting in the Ribbon Cassette".

♦   Paper Feed Button, on top of the cabinet.

♦   Manual Reset Button, accessed by opening the front door of the printer.

♦   4 position DIP switch, mounted on the Controller PC board, accessed through the rear connector backplate.  See the *Programmer's Guide* for communication and diagnostic settings.

♦   Green Slip-in LED light, adjacent to the right edge of the slip path.

♦   Application controlled audible tone.

♦   On Line, Paper Status, Error LED.

Receipt
Cover

Receipt

Front
Cover

Slip or
Check

Extended
Slip Table

Slip In
LED (Green)

Paper Feed
Button

On-Line,
Paper Status,
Error LED
(Green)

**Front of
Printer**

Front Cover

Reset
Button

Switch 1 is shown
in the ON position

**On**

**Off**

4  3  2  1

**DIP Switch**

DIP Switch          **Back of Printer**
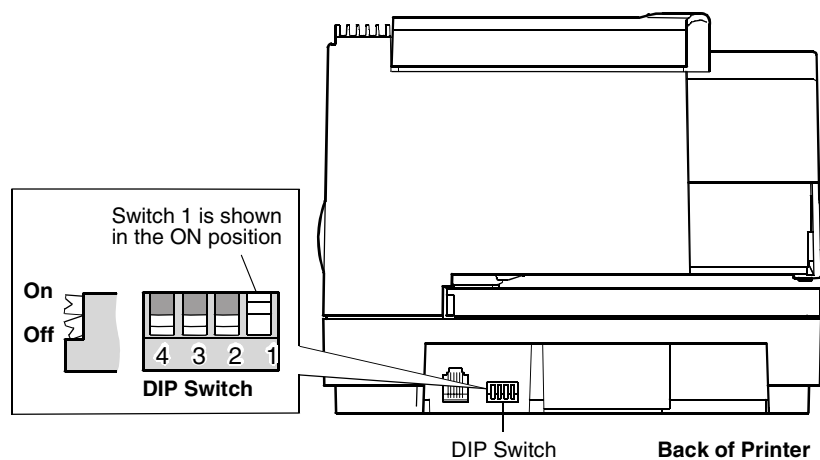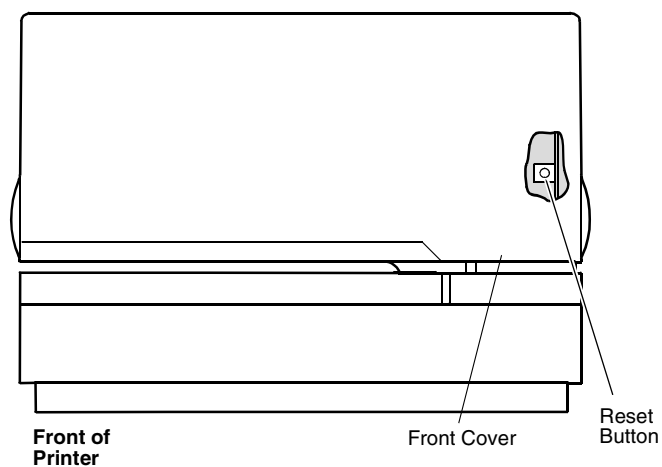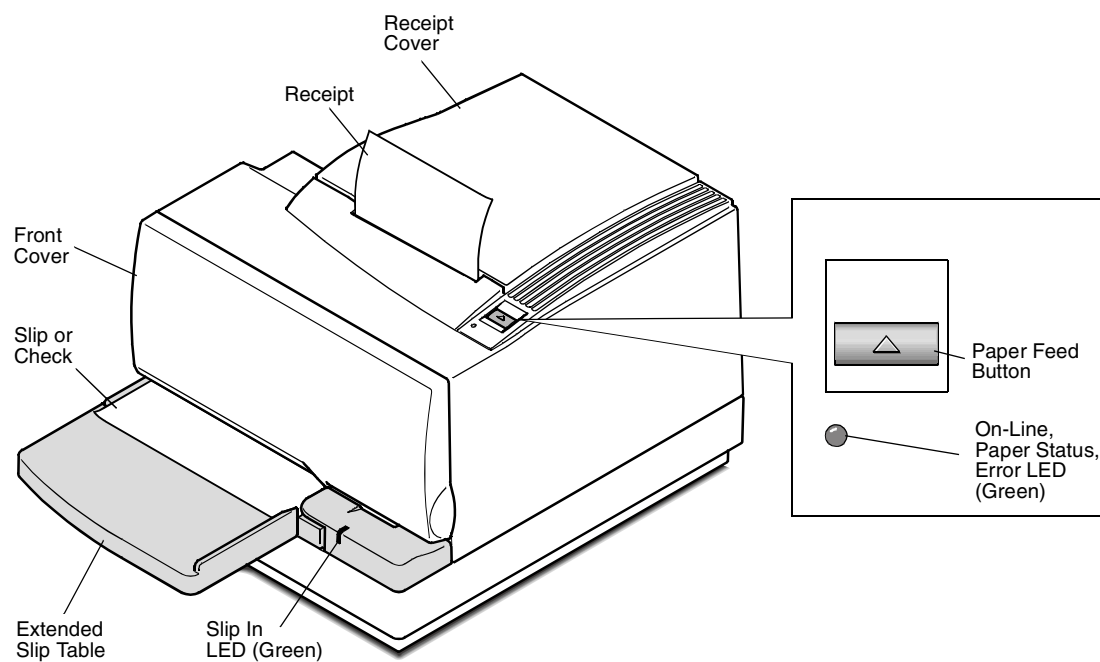
**Location of Human and Electrical Interfaces**

## Power Requirements

The A758 draws 24VDC ±10% power from its standard 55W, or optional 75W, remote supply. The A758 printer can accept 24VDC ±10% power from a host terminal.  To meet NEC Class 2 safety requirements, the host terminal must provide a time delay fuse on the 24V input.

| | Maximum Current | |
| --- | --- | --- |
| **Print Station** | **55 Watt Source** | **75 Watt Source** |
| Slip station: | 6.0A Peak | 6.0A Peak |
| 15 Dots/Char. Avg.[1] | 2.0A Average | |
| Solid Graphics[2] | | 2.7A Average |
| Receipt Station | 6.0A Peak | 9.0A Peak |
| 25% Dot Coverage[3] | 2.3A Average | |
| 50% Dot Coverage[3] | | 3.1A Average |

Note 1.  At rated speed of 260 CPS.
Note 2.  Unidirectional printing.
Note 3.  At rated speed of 130mm/second.

## Electrical Interfaces

The A758 RS232 is equipped with a 9 Pin or 25 Pin male D-shell connector, which will accept an RS-232 cable with a mating female D-shell.

The Parallel A758 is equipped with a 25-pin male D-shell connector. A one to one shielded cable with all 25 lines present may be used to connect the printer to a PC.

The A758 is equipped with a 3 Pin female Mini-DIN plug, which mates with the integral shielded cable on the power supply.  The power supply may be plugged into either a 110 or 240 VAC outlet with a grounded AC cord.

The A758 RS232 has a cash drawer driver, which use a 6-contact Modular Jack (RJ11).  Up to two drawers can be driven; both from one jack with common status.

♦   Voltage:                          24V ±10%

♦   Maximum current:            2.0 Amps

♦   Pulse width:                     50 to 310 msec, programmable

## Switch Settings

These are out-of-service tests or printer settings invoked via the 4 position DIP switch in the back of the printer. Level 1 diagnostics is entered (or exited) by turning switch 1 ON (or off) and resetting or power cycling the printer.

| Switch Setting | Paper Feed Button | Printer Function |
| --- | --- | --- |
| Switch 1 OFF | Not actuated during reset | Printer ready for normal operation. |
| | Actuated during reset | Printer configuration message. |
| Switch 1 ON | Not actuated during reset | Enter download mode to program Flash. |
| | Actuated during reset | Enter level 1 diagnostics scrolling menu. |
| Switches 2, 3 and 4 | | Not Used |

## Character Sets

These character sets are available for printing:

♦ Code Page 437 (US)

♦ Code Page 850 (Multilingual)

♦ Code Page 852 (Slavic)

♦ Code Page 858 (with Eurosymbol)

♦ Code Page 860 (Portuguese)

♦ Code Page 863 (French Canadian)

♦ Code Page 865 (Nordic)

♦ Code Page 866 (Cyrillic)

## Code Page 437

| 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 16 | SP 32 | 0 48 | @ 64 | P 80 | ` 96 | p 112 | Ç 128 | É 144 | á 160 | ░ 176 | └ 192 | ╨ 208 | ∝ 224 | ≡ 240 |
| 01 1 | 11 17 | ! 33 | 1 49 | A 65 | Q 81 | a 97 | q 113 | ü 129 | æ 145 | í 161 | ▒ 177 | ┴ 193 | ╤ 209 | β 225 | ± 241 |
| 02 2 | 12 18 | " 34 | 2 50 | B 66 | R 82 | b 98 | r 114 | é 130 | Æ 146 | ó 162 | ▓ 178 | ┬ 194 | ╥ 210 | Γ 226 | ≥ 242 |
| 03 3 | 13 19 | # 35 | 3 51 | C 67 | S 83 | c 99 | s 115 | â 131 | ô 147 | ú 163 | │ 179 | ├ 195 | ╙ 211 | π 227 | ≤ 243 |
| 04 4 | 14 20 | $ 36 | 4 52 | D 68 | T 84 | d 100 | t 116 | ä 132 | ö 148 | ñ 164 | ┤ 180 | ─ 196 | ╘ 212 | Σ 228 | ⌠ 244 |
| 05 5 | 15 21 | % 37 | 5 53 | E 69 | U 85 | e 101 | u 117 | à 133 | ò 149 | Ñ 165 | ╡ 181 | ┼ 197 | ╒ 213 | σ 229 | ⌡ 245 |
| 06 6 | 16 22 | & 38 | 6 54 | F 70 | V 86 | f 103 | v 118 | å 134 | û 150 | ª 166 | ╢ 182 | ╞ 198 | ╓ 214 | µ 230 | ÷ 246 |
| 07 7 | 17 23 | ' 39 | 7 55 | G 71 | W 87 | g 103 | w 119 | ç 135 | ù 151 | º 167 | ╖ 183 | ╟ 199 | ╫ 215 | τ 231 | ≈ 247 |
| 08 8 | 18 24 | ( 40 | 8 56 | H 72 | X 88 | h 104 | x 120 | ê 136 | ÿ 152 | ¿ 168 | ╕ 184 | ╚ 200 | ╪ 216 | φ 232 | ° 248 |
| 09 9 | 19 25 | ) 41 | 9 57 | I 73 | Y 89 | i 105 | y 121 | ë 137 | Ö 153 | ⌐ 169 | ╣ 185 | ╔ 201 | ┘ 217 | Θ 233 | ∙ 249 |
| 0A 10 | 1A 26 | * 42 | : 58 | J 74 | Z 90 | j 106 | z 122 | è 138 | Ü 154 | ¬ 170 | ║ 186 | ╩ 202 | ┌ 218 | Ω 234 | · 250 |
| 0B 11 | 1B 27 | + 43 | ; 59 | K 75 | [ 91 | k 107 | { 123 | ï 139 | ¢ 155 | ½ 171 | ╗ 187 | ╦ 203 | █ 219 | δ 235 | √ 251 |
| 0C 12 | 1C 28 | , 44 | < 60 | L 76 | \ 92 | l 108 | | 124 | î 140 | £ 156 | ¼ 172 | ╝ 188 | ╠ 204 | ▄ 220 | ∞ 236 | ⁿ 252 |
| 0D 13 | 1D 29 | - 45 | = 61 | M 77 | ] 93 | m 109 | } 125 | ì 141 | ¥ 157 | ¡ 173 | ╜ 189 | ═ 205 | ▌ 221 | Ø 237 | ² 253 |
| 0E 14 | 1E 30 | . 46 | > 62 | N 78 | ^ 94 | n 110 | ~ 126 | Ä 142 | Pt 158 | « 174 | ╛ 190 | ╬ 206 | ▐ 222 | ε 238 | ■ 254 |
| 0F 15 | 1F 31 | / 47 | ? 63 | O 79 | _ 95 | o 111 | DEL 127 | Å 143 | ƒ 159 | » 175 | ┐ 191 | ╧ 207 | ▀ 223 | ∩ 239 | BLANK 255 |

### Code Page 850

| 0_ | 1_ | 2_ | 3_ | 4_ | 5_ | 6_ | 7_ | 8_ | 9_ | A_ | B_ | C_ | D_ | E_ | F_ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00 · 0 | 10 · 16 | 20 · 32 | 30 0 48 | 40 @ 64 | 50 P 80 | 60 ` 96 | 70 p 112 | 80 Ç 128 | 90 É 144 | A0 á 160 | B0 ░ 176 | C0 └ 192 | D0 ð 208 | E0 Ó 224 | F0 - 240 |
| 01 · 1 | 11 · 17 | 21 ! 33 | 31 1 49 | 41 A 65 | 51 Q 81 | 61 a 97 | 71 q 113 | 81 ü 129 | 91 æ 145 | A1 í 161 | B1 ▒ 177 | C1 ┴ 193 | D1 Ð 209 | E1 ß 225 | F1 ± 241 |
| 02 · 2 | 12 · 18 | 22 " 34 | 32 2 50 | 42 B 66 | 52 R 82 | 62 b 98 | 72 r 114 | 82 é 130 | 92 Æ 146 | A2 ó 162 | B2 ▓ 178 | C2 ┬ 194 | D2 Ê 210 | E2 Ô 226 | F2 ― 242 |
| 03 · 3 | 13 · 19 | 23 # 35 | 33 3 51 | 43 C 67 | 53 S 83 | 63 c 99 | 73 s 115 | 83 â 131 | 93 ô 147 | A3 ú 163 | B3 │ 179 | C3 ├ 195 | D3 Ë 211 | E3 Ò 227 | F3 ¾ 243 |
| 04 · 4 | 14 · 20 | 24 $ 36 | 34 4 52 | 44 D 68 | 54 T 84 | 64 d 100 | 74 t 116 | 84 ä 132 | 94 ö 148 | A4 ñ 164 | B4 ┤ 180 | C4 ─ 196 | D4 È 212 | E4 õ 228 | F4 ¶ 244 |
| 05 · 5 | 15 · 21 | 25 % 37 | 35 5 53 | 45 E 69 | 55 U 85 | 65 e 101 | 75 u 117 | 85 à 133 | 95 ò 149 | A5 Ñ 165 | B5 Á 181 | C5 ┼ 197 | D5 ı 213 | E5 Õ 229 | F5 § 245 |
| 06 · 6 | 16 · 22 | 26 & 38 | 36 6 54 | 46 F 70 | 56 V 86 | 66 f 102 | 76 v 118 | 86 å 134 | 96 û 150 | A6 ª 166 | B6 Â 182 | C6 ã 198 | D6 Í 214 | E6 µ 230 | F6 ÷ 246 |
| 07 · 7 | 17 · 23 | 27 ' 39 | 37 7 55 | 47 G 71 | 57 W 87 | 67 g 103 | 77 w 119 | 87 ç 135 | 97 ù 151 | A7 º 167 | B7 À 183 | C7 Ã 199 | D7 Î 215 | E7 þ 231 | F7 ¸ 247 |
| 08 · 8 | 18 · 24 | 28 ( 40 | 38 8 56 | 48 H 72 | 58 X 88 | 68 h 104 | 78 x 120 | 88 ê 136 | 98 ÿ 152 | A8 ¿ 168 | B8 © 184 | C8 ╚ 200 | D8 Ï 216 | E8 Þ 232 | F8 ° 248 |
| 09 · 9 | 19 · 25 | 29 ) 41 | 39 9 57 | 49 I 73 | 59 Y 89 | 69 i 105 | 79 y 121 | 89 ë 137 | 99 Ö 153 | A9 ® 169 | B9 ╣ 185 | C9 ╔ 201 | D9 ┘ 217 | E9 Ú 233 | F9 ¨ 249 |
| 0A · 10 | 1A · 26 | 2A * 42 | 3A : 58 | 4A J 74 | 5A Z 90 | 6A j 106 | 7A z 122 | 8A è 138 | 9A Ü 154 | AA ¬ 170 | BA ║ 186 | CA ╩ 202 | DA ┌ 218 | EA Û 234 | FA · 250 |
| 0B · 11 | 1B · 27 | 2B + 43 | 3B ; 59 | 4B K 75 | 5B [ 91 | 6B k 107 | 7B { 123 | 8B ï 139 | 9B ø 155 | AB ½ 171 | BB ┐ 187 | CB ╦ 203 | DB █ 219 | EB Ù 235 | FB ¹ 251 |
| 0C · 12 | 1C · 28 | 2C , 44 | 3C < 60 | 4C L 76 | 5C \ 92 | 6C l 108 | 7C | 124 | 8C î 140 | 9C £ 156 | AC ¼ 172 | BC ╝ 188 | CC ╠ 204 | DC ▄ 220 | EC ý 236 | FC ³ 252 |
| 0D · 13 | 1D · 29 | 2D - 45 | 3D = 61 | 4D M 77 | 5D ] 93 | 6D m 109 | 7D } 125 | 8D ì 141 | 9D Ø 157 | AD ¡ 173 | BD ¢ 189 | CD ═ 205 | DD ▌ 221 | ED Ý 237 | FD ² 253 |
| 0E · 14 | 1E · 30 | 2E . 46 | 3E > 62 | 4E N 78 | 5E ^ 94 | 6E n 110 | 7E ~ 126 | 8E Ä 142 | 9E × 158 | AE « 174 | BE ¥ 190 | CE ╬ 206 | DE Ì 222 | EE ¯ 238 | FE ■ 254 |
| 0F · 15 | 1F · 31 | 2F / 47 | 3F ? 63 | 4F O 79 | 5F _ 95 | 6F o 111 | 7F △ 127 | 8F Å 143 | 9F ƒ 159 | AF » 175 | BF ┐ 191 | CF ¤ 207 | DF ▀ 223 | EF ´ 239 | FF · 255 |

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| 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 16 | 32 | 0 (48) | @ (64) | P (80) | ` (96) | p (112) | Ç (128) | É (144) | á (160) | ░ (176) | └ (192) | ð (208) | Ó (224) | – (240) |
| 1 | 17 | ! (33) | 1 (49) | A (65) | Q (81) | a (97) | q (113) | ü (129) | Ĺ (145) | í (161) | ▒ (177) | ┴ (193) | Đ (209) | ß (225) | ˝ (241) |
| 2 | 18 | " (34) | 2 (50) | B (66) | R (82) | b (98) | r (114) | é (130) | Í (146) | ó (162) | ▓ (178) | ┬ (194) | Ď (210) | Ô (226) | ˛ (242) |
| 3 | 19 | # (35) | 3 (51) | C (67) | S (83) | c (99) | s (115) | â (131) | ô (147) | ú (163) | │ (179) | ├ (195) | Ë (211) | Ń (227) | ˇ (243) |
| 4 | 20 | $ (36) | 4 (52) | D (68) | T (84) | d (100) | t (116) | ä (132) | ö (148) | Ą (164) | ┤ (180) | ─ (196) | ď (212) | ń (228) | ˆ (244) |
| 5 | 21 | % (37) | 5 (53) | E (69) | U (85) | e (101) | u (117) | ů (133) | Ľ (149) | ą (165) | Á (181) | ┼ (197) | Ň (213) | ň (229) | § (245) |
| 6 | 22 | & (38) | 6 (54) | F (70) | V (86) | f (102) | v (118) | ć (134) | ľ (150) | Ž (166) | Â (182) | Ă (198) | Í (214) | Š (230) | ÷ (246) |
| 7 | 23 | ' (39) | 7 (55) | G (71) | W (87) | g (103) | w (119) | ç (135) | Ś (151) | ž (167) | Ě (183) | ă (199) | Î (215) | š (231) | ¸ (247) |
| 8 | 24 | ( (40) | 8 (56) | H (72) | X (88) | h (104) | x (120) | ł (136) | ś (152) | Ę (168) | Ş (184) | ╚ (200) | ě (216) | Ŕ (232) | ° (248) |
| 9 | 25 | ) (41) | 9 (57) | I (73) | Y (89) | i (105) | y (121) | ë (137) | Ö (153) | ę (169) | ╣ (185) | ╔ (201) | ┘ (217) | Ú (233) | ¨ (249) |
| 10 | 26 | * (42) | : (58) | J (74) | Z (90) | j (106) | z (122) | Ő (138) | Ü (154) | ¬ (170) | ║ (186) | ╩ (202) | ┌ (218) | ŕ (234) | ˙ (250) |
| 11 | 27 | + (43) | ; (59) | K (75) | [ (91) | k (107) | { (123) | ő (139) | Ť (155) | ź (171) | ╗ (187) | ╦ (203) | █ (219) | Ű (235) | ű (251) |
| 12 | 28 | , (44) | < (60) | L (76) | \ (92) | l (108) | \| (124) | î (140) | ť (156) | Č (172) | ╝ (188) | ╠ (204) | ▄ (220) | ý (236) | Ř (252) |
| 13 | 29 | - (45) | = (61) | M (77) | ] (93) | m (109) | } (125) | Ź (141) | Ł (157) | ş (173) | Ż (189) | ═ (205) | Ţ (221) | Ý (237) | ř (253) |
| 14 | 30 | . (46) | > (62) | N (78) | ^ (94) | n (110) | ~ (126) | Ä (142) | × (158) | « (174) | ż (190) | ╬ (206) | Ů (222) | ţ (238) | ■ (254) |
| 15 | 31 | / (47) | ? (63) | O (79) | _ (95) | o (111) | △ (127) | Ć (143) | č (159) | » (175) | ┐ (191) | ¤ (207) | ▀ (223) | ´ (239) | 255 |

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| | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | 0 | @ | P | ` | p | Ç | É | á | ▓ | └ | ð | Ó | - |
| 1 | | | | 1 | A | Q | a | q | ü | æ | í | ▒ | ┴ | Ð | ß | ± |
| 2 | | | " | 2 | B | R | b | r | é | Æ | ó | ▓ | ┬ | Ê | Ô | — |
| 3 | | | # | 3 | C | S | c | s | â | ô | ú | │ | ├ | Ë | Ò | ¾ |
| 4 | | | $ | 4 | D | T | d | t | ä | ö | ñ | ┤ | ─ | È | õ | ¶ |
| 5 | | | % | 5 | E | U | e | u | à | ò | Ñ | Á | ┼ | € | Õ | § |
| 6 | | | & | 6 | F | V | f | v | å | û | ª | Â | ã | Í | µ | ÷ |
| 7 | | | ' | 7 | G | W | g | w | ç | ù | º | À | Ã | Î | þ | ¸ |
| 8 | | | ( | 8 | H | X | h | x | ê | ÿ | ¿ | © | ╚ | Ï | Þ | ° |
| 9 | | | ) | 9 | I | Y | i | y | ë | Ö | ® | ╣ | ╔ | ┘ | Ú | ¨ |
| A | | | * | : | J | Z | j | z | è | Ü | ¬ | ║ | ╩ | ┌ | Û | · |
| B | | | + | ; | K | [ | k | { | ï | ø | ½ | ╗ | ╦ | █ | Ù | ¹ |
| C | | | , | < | L | \ | l | \| | î | £ | ¼ | ╝ | ╠ | ▄ | ý | ³ |
| D | | | - | = | M | ] | m | } | ì | Ø | ¡ | ¢ | ═ | ¦ | Ý | ² |
| E | | | . | > | N | ^ | n | ~ | Ä | × | « | ¥ | ╬ | Ì | ¯ | ■ |
| F | | | / | ? | O | _ | o | △ | Å | ƒ | » | ┐ | ¤ | ▀ | ´ | |

Decimal values (left to right across the high-nibble columns): 00–15, 16–31, 32–47, 48–63, 64–79, 80–95, 96–111, 112–127, 128–143, 144–159, 160–175, 176–191, 192–207, 208–223, 224–239, 240–255.

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| 00 NUL 0 | 10 16 | 20 SP 32 | 30 0 48 | 40 @ 64 | 50 P 80 | 60 ` 96 | 70 p 112 | 80 Ç 128 | 90 É 144 | A0 á 160 | B0 176 | C0 192 | D0 208 | E0 α 224 | F0 ≡ 240 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 XON 1 | 11 17 | 21 ! 33 | 31 1 49 | 41 A 65 | 51 Q 81 | 61 a 97 | 71 q 113 | 81 ü 129 | 91 À 145 | A1 í 161 | B1 177 | C1 ⊥ 193 | D1 209 | E1 β 225 | F1 ± 241 |
| 02 2 18 | 12 34 | 22 " 34 | 32 2 50 | 42 B 66 | 52 R 82 | 62 b 98 | 72 r 114 | 82 é 130 | 92 È 146 | A2 ó 162 | B2 178 | C2 ⊤ 194 | D2 210 | E2 Γ 226 | F2 ≥ 242 |
| 03 XOFF 3 | 13 19 | 23 # 35 | 33 3 51 | 43 C 67 | 53 S 83 | 63 c 99 | 73 s 115 | 83 â 131 | 93 ô 147 | A3 ú 163 | B3 | 179 | C3 ├ 195 | D3 211 | E3 π 227 | F3 ≤ 243 |
| 04 4 20 | 14 30 | 24 $ 36 | 34 4 52 | 44 D 68 | 54 T 84 | 64 d 100 | 74 t 116 | 84 ã 132 | 94 õ 148 | A4 ñ 164 | B4 ┤ 180 | C4 ─ 196 | D4 212 | E4 Σ 228 | F4 ⌠ 244 |
| 05 5 21 | 15 | 25 % 37 | 35 5 53 | 45 E 69 | 55 U 85 | 65 e 101 | 75 u 117 | 85 à 133 | 95 ò 149 | A5 Ñ 165 | B5 181 | C5 ┼ 197 | D5 213 | E5 σ 229 | F5 ⌡ 245 |
| 06 6 22 | 16 | 26 & 38 | 36 6 54 | 46 F 70 | 56 V 86 | 66 f 103 | 76 v 118 | 86 Á 134 | 96 Ú 150 | A6 ª 166 | B6 182 | C6 ├ 198 | D6 214 | E6 µ 230 | F6 ÷ 246 |
| 07 7 23 | 17 | 27 ' 39 | 37 7 55 | 47 G 71 | 57 W 87 | 67 g 103 | 77 w 119 | 87 ç 135 | 97 ù 151 | A7 º 167 | B7 183 | C7 ╫ 199 | D7 215 | E7 τ 231 | F7 ≈ 247 |
| 08 8 24 | 18 | 28 ( 40 | 38 8 56 | 48 H 72 | 58 X 88 | 68 h 104 | 78 x 120 | 88 ê 136 | 98 Ì 152 | A8 ¿ 168 | B8 184 | C8 ╚ 200 | D8 216 | E8 φ 232 | F8 ° 248 |
| 09 9 25 | 19 | 29 ) 41 | 39 9 57 | 49 I 73 | 59 Y 89 | 69 i 105 | 79 y 121 | 89 Ê 137 | 99 Õ 153 | A9 Ò 169 | B9 185 | C9 ╔ 201 | D9 217 | E9 Θ 233 | F9 • 249 |
| 0A LF 10 | 1A 26 | 2A * 42 | 3A : 58 | 4A J 74 | 5A Z 90 | 6A j 106 | 7A z 122 | 8A è 138 | 9A Ü 154 | AA ¬ 170 | BA ║ 186 | CA ╚ 202 | DA ┌ 218 | EA Ω 234 | FA • 250 |
| 0B 11 | 1B ESC 27 | 2B + 43 | 3B ; 59 | 4B K 75 | 5B [ 91 | 6B k 107 | 7B { 123 | 8B Í 139 | 9B ¢ 155 | AB ½ 171 | BB 187 | CB ╦ 203 | DB █ 219 | EB δ 235 | FB √ 251 |
| 0C 12 | 1C 28 | 2C , 44 | 3C < 60 | 4C L 76 | 5C \ 92 | 6C l 108 | 7C | 124 | 8C Ô 140 | 9C £ 156 | AC ¼ 172 | BC ╬ 188 | CC ╠ 204 | DC ▄ 220 | EC ∞ 236 | FC n 252 |
| 0D CR 13 | 1D GS 29 | 2D - 45 | 3D = 61 | 4D M 77 | 5D ] 93 | 6D m 109 | 7D } 125 | 8D ì 141 | 9D Ú 157 | AD ¡ 173 | BD 189 | CD = 205 | DD █ 221 | ED ∅ 237 | FD ² 253 |
| 0E 14 | 1E 30 | 2E . 46 | 3E > 62 | 4E N 78 | 5E ^ 94 | 6E n 110 | 7E ~ 126 | 8E Ã 142 | 9E Pt 158 | AE « 174 | BE 190 | CE ╬ 206 | DE █ 222 | EE ε 238 | FE ■ 254 |
| 0F 15 | 1F 31 | 2F / 47 | 3F ? 63 | 4F O 79 | 5F _ 95 | 6F o 111 | 7F SP 127 | 8F Â 143 | 9F Ó 159 | AF » 175 | BF ┐ 191 | CF ┴ 207 | DF ▄ 223 | EF ∩ 239 | FF 255 |

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| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00 NUL 0 | 10 16 | 20 SP 32 | 30 0 48 | 40 @ 64 | 50 P 80 | 60 ` 96 | 70 p 112 | 80 Ç 128 | 90 É 144 | A0 ¦ 160 | B0 ⣿ 176 | C0 └ 192 | D0 ⊥ 208 | E0 α 224 | F0 ≡ 240 |
| 01 XON 1 | 11 17 | 21 ! 33 | 31 1 49 | 41 A 65 | 51 Q 81 | 61 a 97 | 71 q 113 | 81 ü 129 | 91 È 145 | A1 ' 161 | B1 ░ 177 | C1 ⊥ 193 | D1 ╤ 209 | E1 β 225 | F1 ± 241 |
| 02 2 | 12 18 | 22 " 34 | 32 2 50 | 42 B 66 | 52 R 82 | 62 b 98 | 72 r 114 | 82 é 130 | 92 Ê 146 | A2 ó 162 | B2 ▓ 178 | C2 ⊤ 194 | D2 ╥ 210 | E2 Γ 226 | F2 ≥ 242 |
| 03 XOFF 3 | 13 19 | 23 # 35 | 33 3 51 | 43 C 67 | 53 S 83 | 63 c 99 | 73 s 115 | 83 â 131 | 93 ô 147 | A3 ú 163 | B3 │ 179 | C3 ├ 195 | D3 ╙ 211 | E3 π 227 | F3 ≤ 243 |
| 04 4 | 14 20 | 24 $ 36 | 34 4 52 | 44 D 68 | 54 T 84 | 64 d 100 | 74 t 116 | 84 Â 132 | 94 Ë 148 | A4 ¨ 164 | B4 ┤ 180 | C4 ─ 196 | D4 ╘ 212 | E4 Σ 228 | F4 ⌠ 244 |
| 05 5 | 15 21 | 25 % 37 | 35 5 53 | 45 E 69 | 55 U 85 | 65 e 101 | 75 u 117 | 85 à 133 | 95 Ï 149 | A5 ³ 165 | B5 ╡ 181 | C5 ┼ 197 | D5 ╒ 213 | E5 σ 229 | F5 ⌡ 245 |
| 06 6 | 16 22 | 26 & 38 | 36 6 54 | 46 F 70 | 56 V 86 | 66 f 103 | 76 v 118 | 86 ¶ 134 | 96 û 150 | A6 ¸ 166 | B6 ╢ 182 | C6 ╞ 198 | D6 ╓ 214 | E6 μ 230 | F6 ÷ 246 |
| 07 7 | 17 23 | 27 ' 39 | 37 7 55 | 47 G 71 | 57 W 87 | 67 g 103 | 77 w 119 | 87 ç 135 | 97 ù 151 | A7 ¯ 167 | B7 ╖ 183 | C7 ╟ 199 | D7 ╫ 215 | E7 τ 231 | F7 ≈ 247 |
| 08 8 | 18 24 | 28 ( 40 | 38 8 56 | 48 H 72 | 58 X 88 | 68 h 104 | 78 x 120 | 88 ê 136 | 98 Î 152 | A8 Î 168 | B8 ╕ 184 | C8 ╚ 200 | D8 ╪ 216 | E8 φ 232 | F8 ° 248 |
| 09 9 | 19 25 | 29 ) 41 | 39 9 57 | 49 I 73 | 59 Y 89 | 69 i 105 | 79 y 121 | 89 ë 137 | 99 ô 153 | A9 ⌐ 169 | B9 ╣ 185 | C9 ╔ 201 | D9 ┘ 217 | E9 Θ 233 | F9 • 249 |
| 0A LF 10 | 1A 26 | 2A * 42 | 3A : 58 | 4A J 74 | 5A Z 90 | 6A j 106 | 7A z 122 | 8A è 138 | 9A Ü 154 | AA ¬ 170 | BA ║ 186 | CA ╩ 202 | DA ┌ 218 | EA Ω 234 | FA · 250 |
| 0B 11 | 1B ESC 27 | 2B + 43 | 3B ; 59 | 4B K 75 | 5B [ 91 | 6B k 107 | 7B { 123 | 8B ï 139 | 9B ¢ 155 | AB ½ 171 | BB ╗ 187 | CB ╦ 203 | DB █ 219 | EB δ 235 | FB √ 251 |
| 0C 12 | 1C 28 | 2C , 44 | 3C < 60 | 4C L 76 | 5C \ 92 | 6C l 108 | 7C | 124 | 8C î 140 | 9C £ 156 | AC ¼ 172 | BC ╝ 188 | CC ╠ 204 | DC ▄ 220 | EC ∞ 236 | FC ⁿ 252 |
| 0D CR 13 | 1D GS 29 | 2D - 45 | 3D = 61 | 4D M 77 | 5D ] 93 | 6D m 109 | 7D } 125 | 8D = 141 | 9D ù 157 | AD ¾ 173 | BD ╜ 189 | CD = 205 | DD ▌ 221 | ED Ø 237 | FD ² 253 |
| 0E 14 | 1E 30 | 2E . 46 | 3E > 62 | 4E N 78 | 5E ^ 94 | 6E n 110 | 7E ~ 126 | 8E À 142 | 9E Û 158 | AE « 174 | BE ╛ 190 | CE ╬ 206 | DE ▐ 222 | EE ε 238 | FE ■ 254 |
| 0F 15 | 1F 31 | 2F / 47 | 3F ? 63 | 4F O 79 | 5F _ 95 | 6F o 111 | 7F SP 127 | 8F § 143 | 9F ƒ 159 | AF » 175 | BF ╗ 191 | CF ╧ 207 | DF ▀ 223 | EF ∩ 239 | FF 255 |

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| | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00 | (0) | (16) | (32) | 0 (48) | @ (64) | P (80) | ` (96) | p (112) | Ç (128) | É (144) | á (160) | ▒ (176) | └ (192) | ╨ (208) | ∝ (224) | ≡ (240) |
| 01 | (1) | (17) | ! (33) | 1 (49) | A (65) | Q (81) | a (97) | q (113) | ü (129) | æ (145) | í (161) | ▓ (177) | ┴ (193) | ╤ (209) | β (225) | ± (241) |
| 02 | (2) | (18) | " (34) | 2 (50) | B (66) | R (82) | b (98) | r (114) | é (130) | Æ (146) | ó (162) | ▓ (178) | ┬ (194) | ╥ (210) | Γ (226) | ≥ (242) |
| 03 | (3) | (19) | # (35) | 3 (51) | C (67) | S (83) | c (99) | s (115) | â (131) | ô (147) | ú (163) | │ (179) | ├ (195) | ╙ (211) | π (227) | ≤ (243) |
| 04 | (4) | (20) | $ (36) | 4 (52) | D (68) | T (84) | d (100) | t (116) | ä (132) | ö (148) | ñ (164) | ┤ (180) | ─ (196) | ╘ (212) | Σ (228) | ⌠ (244) |
| 05 | (5) | (21) | % (37) | 5 (53) | E (69) | U (85) | e (101) | u (117) | à (133) | ò (149) | Ñ (165) | ╡ (181) | ┼ (197) | ╒ (213) | σ (229) | ⌡ (245) |
| 06 | (6) | (22) | & (38) | 6 (54) | F (70) | V (86) | f (103) | v (118) | å (134) | û (150) | ª (166) | ╢ (182) | ╞ (198) | ╓ (214) | µ (230) | ÷ (246) |
| 07 | (7) | (23) | ' (39) | 7 (55) | G (71) | W (87) | g (103) | w (119) | ç (135) | ù (151) | º (167) | ╖ (183) | ╟ (199) | ╫ (215) | τ (231) | ≈ (247) |
| 08 | (8) | (24) | ( (40) | 8 (56) | H (72) | X (88) | h (104) | x (120) | ê (136) | ÿ (152) | ¿ (168) | ╕ (184) | ╚ (200) | ╪ (216) | Φ (232) | ° (248) |
| 09 | (9) | (25) | ) (41) | 9 (57) | I (73) | Y (89) | i (105) | y (121) | ë (137) | Ö (153) | ⌐ (169) | ╣ (185) | ╔ (201) | ┘ (217) | Θ (233) | • (249) |
| 0A | (10) | (26) | * (42) | : (58) | J (74) | Z (90) | j (106) | z (122) | è (138) | Ü (154) | ¬ (170) | ║ (186) | ╩ (202) | ┌ (218) | Ω (234) | · (250) |
| 0B | (11) | (27) | + (43) | ; (59) | K (75) | [ (91) | k (107) | { (123) | ï (139) | ø (155) | ½ (171) | ╗ (187) | ╦ (203) | █ (219) | δ (235) | √ (251) |
| 0C | (12) | (28) | , (44) | < (60) | L (76) | \ (92) | l (108) | \| (124) | î (140) | £ (156) | ¼ (172) | ╝ (188) | ╠ (204) | ▄ (220) | ∞ (236) | ⁿ (252) |
| 0D | (13) | (29) | - (45) | = (61) | M (77) | ] (93) | m (109) | } (125) | ì (141) | Ø (157) | ¡ (173) | ╜ (189) | ═ (205) | ▌ (221) | ∅ (237) | ² (253) |
| 0E | (14) | (30) | . (46) | > (62) | N (78) | ^ (94) | n (110) | ~ (126) | Ä (142) | Pt (158) | « (174) | ╛ (190) | ╬ (206) | ▐ (222) | ε (238) | ■ (254) |
| 0F | (15) | (31) | / (47) | ? (63) | O (79) | _ (95) | o (111) | △ (127) | Å (143) | ƒ (159) | ¤ (175) | ┐ (191) | ╧ (207) | ▀ (223) | ∩ (239) | (255) |

## Code Page 866

| | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| x0 | (0) | (16) | (32) | 0 (48) | @ (64) | P (80) | ` (96) | p (112) | А (128) | Р (144) | а (160) | ░ (176) | └ (192) | ╨ (208) | р (224) | Ё (240) |
| x1 | (1) | (17) | ! (33) | 1 (49) | A (65) | Q (81) | a (97) | q (113) | Б (129) | С (145) | б (161) | ▒ (177) | ┴ (193) | ╤ (209) | с (225) | ё (241) |
| x2 | (2) | (18) | " (34) | 2 (50) | B (66) | R (82) | b (98) | r (114) | В (130) | Т (146) | в (162) | ▓ (178) | ┬ (194) | ╥ (210) | т (226) | Є (242) |
| x3 | (3) | (19) | # (35) | 3 (51) | C (67) | S (83) | c (99) | s (115) | Г (131) | У (147) | г (163) | │ (179) | ├ (195) | ╙ (211) | у (227) | є (243) |
| x4 | (4) | (20) | $ (36) | 4 (52) | D (68) | T (84) | d (100) | t (116) | Д (132) | Ф (148) | д (164) | ┤ (180) | ─ (196) | ╘ (212) | ф (228) | Ї (244) |
| x5 | (5) | (21) | % (37) | 5 (53) | E (69) | U (85) | e (101) | u (117) | Е (133) | Х (149) | е (165) | ╡ (181) | ┼ (197) | ╒ (213) | х (229) | ї (245) |
| x6 | (6) | (22) | & (38) | 6 (54) | F (70) | V (86) | f (103) | v (118) | Ж (134) | Ц (150) | ж (166) | ╢ (182) | ╞ (198) | ╓ (214) | ц (230) | Ў (246) |
| x7 | (7) | (23) | ' (39) | 7 (55) | G (71) | W (87) | g (103) | w (119) | З (135) | Ч (151) | з (167) | ╖ (183) | ╟ (199) | ╫ (215) | ч (231) | ў (247) |
| x8 | (8) | (24) | ( (40) | 8 (56) | H (72) | X (88) | h (104) | x (120) | И (136) | Ш (152) | и (168) | ╕ (184) | ╚ (200) | ╪ (216) | ш (232) | ° (248) |
| x9 | (9) | (25) | ) (41) | 9 (57) | I (73) | Y (89) | i (105) | y (121) | Й (137) | Щ (153) | й (169) | ╣ (185) | ╔ (201) | ┘ (217) | щ (233) | ∙ (249) |
| xA | (10) | (26) | * (42) | : (58) | J (74) | Z (90) | j (106) | z (122) | К (138) | Ъ (154) | к (170) | ║ (186) | ╩ (202) | ┌ (218) | ъ (234) | · (250) |
| xB | (11) | (27) | + (43) | ; (59) | K (75) | [ (91) | k (107) | { (123) | Л (139) | Ы (155) | л (171) | ╗ (187) | ╦ (203) | █ (219) | ы (235) | √ (251) |
| xC | (12) | (28) | , (44) | < (60) | L (76) | \ (92) | l (108) | \| (124) | М (140) | Ь (156) | м (172) | ╝ (188) | ╠ (204) | ▄ (220) | ь (236) | № (252) |
| xD | (13) | (29) | - (45) | = (61) | M (77) | ] (93) | m (109) | } (125) | Н (141) | Э (157) | н (173) | ╜ (189) | ═ (205) | ▌ (221) | э (237) | ¤ (253) |
| xE | (14) | (30) | . (46) | > (62) | N (78) | ^ (94) | n (110) | ~ (126) | О (142) | Ю (158) | о (174) | ╛ (190) | ╬ (206) | ▐ (222) | ю (238) | ■ (254) |
| xF | (15) | (31) | / (47) | ? (63) | O (79) | _ (95) | o (111) | △ (127) | П (143) | Я (159) | п (175) | ┐ (191) | ╧ (207) | ▀ (223) | я (239) | (255) |

# Dimensions and Weight



| Height | 178 mm (7.0 inches) |
|---|---|
| **Height with Cover Open** | 280 mm (11.0 inches) |
| **Width** | 229 mm (9.0 inches) |
| **Depth** | 264 mm (10.4 inches) |
| **Depth with Extended Slip Table** | 347 mm (13.7 inches) |
| **Weight** | 4.3 kg (9.4 lbs.), Non-MICR |
| | 4.4 kg (9.6 lbs.), MICR and Extended Slip Table |
| | 4.9 kg (10.8 lbs.), MICR and Check Flip |

# Chapter 6: Communication Interface

- ♦ **Communication Overview**

- ♦ **RS-232C Interface**

- ♦ **Parallel Interface**

# Communication Overview

In order for the printer to communicate with the host, a communication link must be set up. The A758 printer supports either the RS-232C or the IEEE 1284 parallel communication interfaces. Other communication interfaces may be available as options.

The RS-232C interface has a protocol associated with it that the host must understand and adhere to. Only when the interface parameters match and the proper protocol is used will the host and the printer be able to communicate.

Once the communication link is established, commands can be sent to the printer. This section describes how to send commands to the printer using DOS and BASIC. This section does not take into account the necessary protocol, but is meant as a general introduction to how the printer functions.

## Using DOS to Send Commands

One way of getting commands to the printer is to send them directly from DOS. For example, assuming that the printer and computer are set to the same communications parameters, the command:

```
COPY CON: COM1:
```

sets the computer up such that the hexadecimal code corresponding to any key that was pressed would be sent to the communication port COM1 when the COPY mode is exited. If the printer is connected to COM1, then the data will go to the printer.

Exit the COPY mode by typing:

```
CTRL Z
```

and then pressing the ENTER key. Once the computer knows to direct data from print commands to the proper port, commands can be sent from any software program.

## Using BASIC to Send Commands

In BASIC, printer commands are sent as a string of characters preceded by the LPRINT command. For example:

```
LPRINT CHR$(&H0A)
```

sends the hexadecimal number 0A to the printer, which causes the printer to print the contents of its print buffer. Commands sent prior to 0A tell the printer exactly how data should appear on the paper. For example:

```
LPRINT CHR$(&H12); "ABC"; CHR$(&H0A)
```

sends the hexadecimal numbers 12 41 42 43 0A to the printer. This causes the printer to set itself to double wide mode (12), load the print buffer with "ABC" (41 42 43), and finally, print (0A). Again, the communication link that the BASIC program configures to must be matched to that of the printer.

# RS-232C Interface

The RS-232C interface uses either the XON/XOFF (software) or DTR/DSR (hardware) protocol to control the flow of information between the computer and the printer. For XON/XOFF, a particular character is sent back and forth between the host and the printer to regulate the communication. For DTR/DSR, changes in the DTR/DSR signal on the RS 232 interface coordinate the information flow.

The RS-232C interface offers standard settings that are selected with the Configuration Menu. Use of the Configuration Menu is described in "Configuring the Printer" in this manual.

## Print Speed and Timing

The fast speed of the printer requires the application to send data to the printer at least as fast as it is printed. The application must also allow output lines to be buffered ahead at the printer, so the printer will be able to print each line immediately after the preceding line, without stopping to wait for more data. Ideally, the application will send all the data for an entire receipt or slip without pausing between characters or lines transmitted.

If the application sends data at 9600 baud and pauses between lines for as short a time as 50 milliseconds, the printer will never be able to print at full speed. However, if the application sends data at 19.2 K baud and does not pause between lines, the printer will be able to print at its full speed of 2400 lines/minute. The table below shows that with a pause of 50 milliseconds after each line, the transmit time equals or exceeds the printer process time, slowing down the printer, regardless of the baud rate.

**50ms Pause after Each Line**

| Characters/Line | Lines/Receipt | Transmit Time (19.2 K Baud) | Process Time* |
|---|---|---|---|
| 20 | 20 | 1.2 Seconds | 0.5 Seconds |
| 20 | 40 | 2.4 Seconds | 1.0 Seconds |
| 44 | 20 | 1.44 Seconds | 0.5 Seconds |
| 44 | 40 | 2.88 Seconds | 1.0 Seconds |

* Process Time is the time it would take the printer to process the data if all transmitted data was present. (It is not the time it takes to print the receipt.)

Example: 20 characters/line, with 20 lines = 0.5 seconds process time for the printer. It takes 1.2 seconds to send the data to the printer at 19.2K-baud speed with a 50ms delay after each line. Thus the printer would have to wait 0.7 seconds longer to receive the data than it could process it if no delays existed and the transmission speed were faster.

The next table shows that with no delay between lines, the transmit time is much less than the process time, allowing the printer to print at full speed.

**No Delay after Each Line**

| Characters/Line | Lines/Receipt | Transmit Time (19.2 K Baud) | Process Time* |
|---|---|---|---|
| 20 | 20 | 0.2 Seconds | 0.5 Seconds |
| 20 | 40 | 0.4 Seconds | 1.0 Seconds |
| 44 | 20 | 0.44 Seconds | 0.5 Seconds |
| 44 | 40 | 0.88 Seconds | 1.0 Seconds |

# RS-232 Communications

The A758 offers an industry standard RS-232 serial point-to-point interface, with options available to the user.

Options that may be set through the Configuration Menu are:

♦ The baud rate of 115200, 57600, 38400, 19200, 9600, 4800, 2400, or 1200 baud

♦ The number of data bits to seven or eight

♦ The number of stop bits to one or two

♦ Enable or disable parity

♦ The flow control to software (XON/XOFF) or Hardware (DTR/DSR)

♦ Set the printer to ignore data errors or print a "?" upon encountering an error

## RS-232 Interface Timing

Receiving data, DTR/DSR or XON/XOFF selected:

[DTR MARK]   - Between power on and ready to accept data.

                    - In an error state.

                    - Remaining space in the 4K buffer falls below 256 bytes. *

[DTR SPACE]  - When ready to accept data.

                    - Remaining space in the 4K buffer rises above 512 bytes. **

[XON sent]     - When ready to accept data after power on.

                    - Remaining space in the 4K buffer rises above 512 bytes. **

[XOFF sent]   - In an error state.

                    - Remaining space in the 4K buffer falls below 256 bytes*

*   - 10 bytes in line mode.

** - 20 bytes in line mode.

Sending data (status):

In DTR/DSR mode, data is sent only when DSR is SPACE.

In XON/XOFF mode, DSR state is ignored.

## XON/XOFF Protocol

The XON/XOFF characters coordinate the information transfer between the printer and the host computer. The printer sends an XON character when it is ready to receive data and it sends an XOFF character when it cannot accept any more data. The software on the host computer must monitor the communication link as shown in the following flowchart in order to send data at the appropriate times.

If XON/XOFF has been selected, the printer also toggles the DTR signal, as described in the next section, but it does not look at the DSR signal to transmit data.

Host Flow Control Diagram
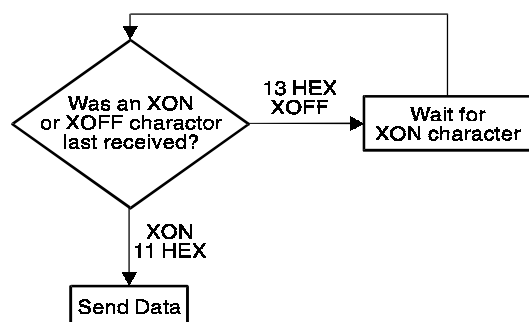


XON character = hexadecimal 11.
XOFF character = hexadecimal 13.

## DTR/DSR Protocol

The DTR signal is used to control data transmission to and from the printer. It is driven low when the printer is ready to receive data and driven high when it cannot accept any more data. Data is transmitted from the printer after it confirms that the DSR signal is low.
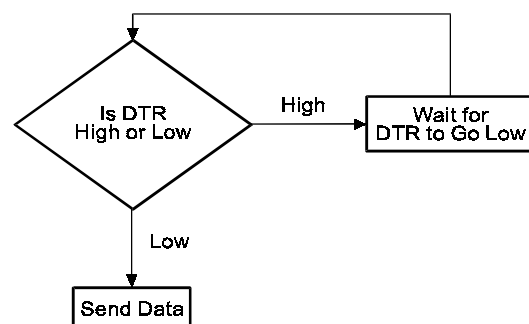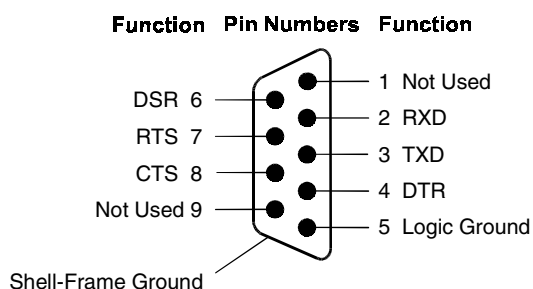
# Connector Pin-outs

This section describes the pin settings for the connectors on the back of the printer.
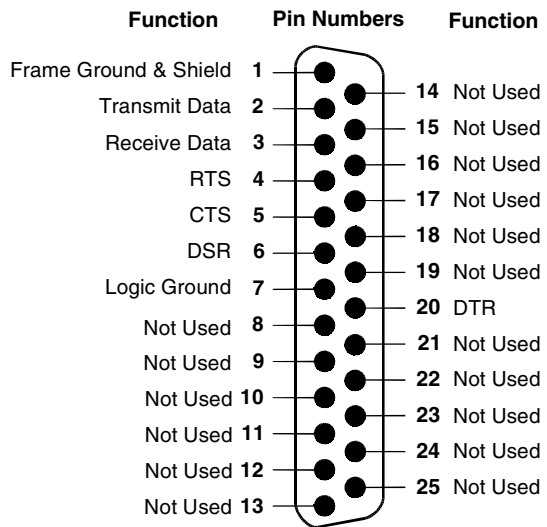
## Communication Connectors

The following illustrations show the RS-232C communication connectors and pin assignments. The connectors are located at the rear of the printer, and are specified as: male DB9, 9-pin or female DB-25, 25 pin D-shell, with RTS and CTS pins connected.

**9-pin DB-9 Connector**

| Function | Pin Numbers | Function |
| --- | --- | --- |
| | 1 | Not Used |
| DSR 6 | 2 | RXD |
| RTS 7 | 3 | TXD |
| CTS 8 | 4 | DTR |
| Not Used 9 | 5 | Logic Ground |

Shell-Frame Ground

**25-pin DB-25 Connector**

| Function | Pin Numbers | Function |
| --- | --- | --- |
| Frame Ground & Shield | 1 | |
| Transmit Data | 2 | 14 Not Used |
| Receive Data | 3 | 15 Not Used |
| RTS | 4 | 16 Not Used |
| CTS | 5 | 17 Not Used |
| DSR | 6 | 18 Not Used |
| Logic Ground | 7 | 19 Not Used |
| Not Used | 8 | 20 DTR |
| Not Used | 9 | 21 Not Used |
| Not Used | 10 | 22 Not Used |
| Not Used | 11 | 23 Not Used |
| Not Used | 12 | 24 Not Used |
| Not Used | 13 | 25 Not Used |

## Power Connector

With RS-232C, the printer is always remotely powered. The following illustration shows the power cable connector and pin assignments. The power cable connector is a 3-pin mini DIN plug and is located at the rear of the printer.

**Function  Pin Numbers  Function**

+24 Volt 2 — 3 Not Used
1 Ground
Shell - Shield
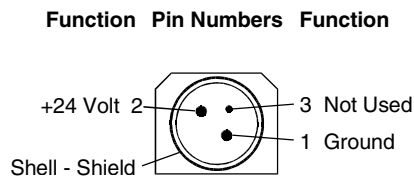
## Cash Drawer Connector

A 6-contact modular jack (RJ11) is available to drive a cash drawer with dedicated feedback, or up to two cash drawers without feedback. The following illustration shows the pinouts for the cash drawer connector.

Pin 1          Pin 6
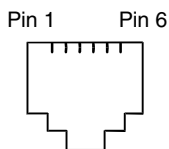
The following table shows the pinouts for the cash drawer. The connector can support two cash drawers with a Y cable, and is located at the rear of the printer.
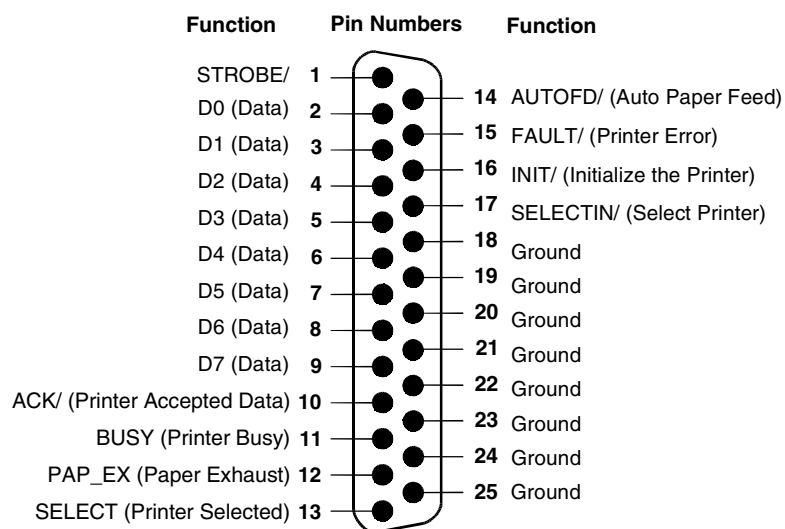
| Pin Number | Cash Drawer Connector |
|------------|-----------------------|
| 1 | Frame Ground |
| 2 | Drawer 1 Solenoid |
| 3 | Drawer 1 Status Switch |
| 4 | +24 Volts (to Solenoid +) |
| 5 | Drawer 2 Solenoid |
| 6 | Ground (Status Switch Return) |

The maximum current supplied is 2.0 Amps, and the pulse width is programmable from 50 to 300 milliseconds.

# Parallel Interface

The A758 supports IEEE 1284 bi-directional parallel communications in compatibility mode, nibble mode, and byte mode (user selectable via Level 1 diagnostics set up mode).  The full name is IEEE Standard Signaling Method for a Bi-directional Parallel Peripheral Interface for Personal Computers, IEEE Std. 1284-1994.

The Parallel A758 is equipped with a 25 Pin female D-shell connector.  This connector has the same pin-out as the industry standard PC parallel connector. A one-to-one shielded cable with all 25 lines present may be used to connect the printer to a PC.

| Function | Pin Numbers | | Function |
|---|---|---|---|
| STROBE/ | 1 | 14 | AUTOFD/ (Auto Paper Feed) |
| D0 (Data) | 2 | 15 | FAULT/ (Printer Error) |
| D1 (Data) | 3 | 16 | INIT/ (Initialize the Printer) |
| D2 (Data) | 4 | 17 | SELECTIN/ (Select Printer) |
| D3 (Data) | 5 | 18 | Ground |
| D4 (Data) | 6 | 19 | Ground |
| D5 (Data) | 7 | 20 | Ground |
| D6 (Data) | 8 | 21 | Ground |
| D7 (Data) | 9 | 22 | Ground |
| ACK/ (Printer Accepted Data) | 10 | 23 | Ground |
| BUSY (Printer Busy) | 11 | 24 | Ground |
| PAP_EX (Paper Exhaust) | 12 | 25 | Ground |
| SELECT (Printer Selected) | 13 | | |

**Parallel 25-Pin D-Shell**

| Pin 1 | Strobe/ | Pin 14 | Auto FD |
|---|---|---|---|
| Pin 2 | D0 | Pin 15 | Fault/ |
| Pin 3 | D1 | Pin 16 | Reset in/ |
| Pin 4 | D2 | Pin 17 | Select IN |
| Pin 5 | D3 | Pin 18 | Ground |
| Pin 6 | D4 | Pin 19 | Ground |
| Pin 7 | D5 | Pin 20 | Ground |
| Pin 8 | D6 | Pin 21 | Ground |
| Pin 9 | D7 | Pin 22 | Ground |
| Pin 10 | ACK/ | Pin 23 | Ground |
| Pin 11 | Busy | Pin 24 | Ground |
| Pin 12 | Paper Exhaust | Pin 25 | Ground |
| Pin 13 | Select Out | Shell | Frame Ground |

# Chapter 7: Programming Guide

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  - **User Data Storage Commands**
  - **Flash Download Commands**

# Command Conventions

The following information describes how each command is organized:

**Name:**                           Name of command.

**ASCII:**                          The ASCII control code.

**Hexadecimal:**                    The Hexadecimal control code.

**Decimal:**                        The Decimal control code.

**Value:**                          A description of the command operands.

**Range:**                          The upper and lower limits of the command operand.

**Default:**                        The command operand default after printer reset.

**Description:**                    Brief description and summary of the command.

**Formulas:**                       Any formulas used for this command.

**Exceptions:**                     Describes any exceptions to this command, i.e.:
                                    incompatible commands.

**Related Information:**            Describes related information for this command, i.e.:
                                    bit information.

# List of Commands and Location

Commands control all operations and functions of the printer. This includes selecting the size and placement of characters and graphics on the receipt or the slip and feeding and cutting the paper. Any of the commands may be used in any combination to program a host computer to communicate with the printer (unless otherwise noted).

Some commands listed and described here may not be implemented. They will be identified as "not implemented". If received, they are ignored and not sent to the print buffer as data. Any non-legal commands are sent to the print buffer as data.

## By Command Code

All items in **BOLD** are new or have additional functionality when compared to the A756.

| Code (Hexadecimal) | Command | Page |
|---|---|---|
| 09 (HT) | Horizontal Tab | 127 |
| 0A (LF) | Print and Feed Paper One Line | 121 |
| **0C (FF)** | **Print and Return to Standard Mode** | **179** |
| 0C (FF) | Print and Eject Slip | 121 |
| 0D (CR) | Print and Carriage Return | 121 |
| 10 | Clear Printer | 112 |
| 10 04 n | Real Time Status Transmission (DLE Sequence) | 166 |
| 10 05 n | Real Time Request to Printer (GS Sequence) | 169 |
| 11 | Close Form | 113 |
| 12 | Select Double-Wide Characters | 134 |
| 13 | Select Single-Wide Characters | 134 |
| 14 *n* | Feed *n* Print Lines | 122 |
| 15 *n* | Feed *n* Dot Rows | 122 |
| 16 *n* | Add *n* Extra Dot Rows | 123 |
| 17 | Print | 123 |
| 18 | Open Form | 113 |
| **18** | **Cancel Print Data in Page Mode** | **179** |
| 19 | Perform Full Knife Cut | 113 |
| 1A | Perform Partial Knife Cut | 114 |
| **1B (+ *.bmp)** | **Download BMP Logo** | **146** |
| 1B 07 | Generate Tone | 114 |
| **1B 0C** | **Print Data in Page Mode** | **180** |
| 1B 12 | Select 90 Degree Counter-Clockwise Rotated Print | 134 |
| 1B 14 *n* | Set Column | 127 |
| 1B 16 *n* | Select Pitch (Column Width) | 135 |
| 1B 20 *n* | Set Character Right-Side Spacing | 135 |
| 1B 21 *n* | Select Print Modes | 136 |
| 1B 24 *n1 n2* | Set Absolute Starting Position | 128 |

| Code (Hexadecimal) | Command | Page |
|---|---|---|
| 1B 25 *n* | Select or Cancel User-Defined Character Set | 137 |
| 1B 26 3 *c1 c2…dn* | Define User-Defined Characters | 137 |
| 1B 27 *m a0 a1 a2 d1 … dm* | Write to User Data Storage | 198 |
| 1B 2A *m n1 n2 d1 … dn* | Select Bit Image Mode | 146 |
| **1B 2D *n*** | **Select or Cancel Underline Mode** | **139** |
| 1B 32 | Set Line Spacing to 1/6 Inch | 124 |
| 1B 33 *n* | Set Line Spacing | 124 |
| 1B 34 m a0 a1 a2 | Read from User Data Storage | 198 |
| 1B 3A 30 30 30 | Copy Character Set from ROM to RAM | 139 |
| 1B 3C | Return Home | 114 |
| 1B 3D *n* | Select Peripheral Device (For Multi-Drop) | 114 |
| 1B 3F n | Cancel User-defined Characters | 139 |
| 1B 40 | Initialize Printer | 115 |
| 1B 43 *n* | Set Slip Paper Eject Length | 115 |
| 1B 44 [*n*] *k 00* | Set Horizontal Tabs | 129 |
| 1B 45 *n* | Select or Cancel Emphasized Mode | 140 |
| 1B 47 | Select Double Strike (A756 Emulation) | 140 |
| 1B 48 | Cancel Double Strike | 141 |
| **1B 49 n** | **Set or Cancel Italic Print** | **141** |
| 1B 4A *n* | Print and Feed Paper | 124 |
| 1B 4B *n* | Print and Reverse Feed Paper | 125 |
| **1B 4C** | **Select Page Mode** | **180** |
| 1B 4C n1 n2 d1…dn | Select Double Density Graphics (A756 Emulation) | 149 |
| **1B 52 *n*** | **Select International Character Set** | **141** |
| **1B 53** | **Select Standard Mode** | **181** |
| **1B 54 *n*** | **Select Print Direction in Page Mode** | **182** |
| 1B 55 *n* | Select or Cancel Unidirectional Printing Mode | 142 |
| 1B 56 *n* | Select or Cancel 90 Degrees Clockwise Rotated | 142 |
| **1B 57 *n1, n2,…n8*** | **Set Printing Area in Page Mode** | **183** |
| 1B 59 n1 n2 d1…dn | Select Double Density Graphics | 149 |
| 1B 5B 7D | Switch to Flash Download Mode | 202 |
| 1B 5C *n1 n2* | Set Relative Print Position | 129 |
| 1B 61 *n* | Select Justification | 131 |
| 1B 63 30 *n* | Select Receipt or Slip for Printing; Slip for MICR Read | 115 |
| 1B 63 31 *n* | Select Receipt or Slip for Setting Line Spacing | 116 |
| **1B 63 33 *n*** | **Select Paper Sensors to Output Paper End Signals (Parallel Only)** | **116** |
| 1B 63 34 *n* | Select Sensors to Stop Printing | 117 |
| 1B 63 35 *n* | Enable or Disable Panel Buttons | 117 |

| Code (Hexadecimal) | Command | Page |
|---|---|---|
| 1B 63 36 *n* | Enable or Disable Online Switch | 117 |
| 1B 64 *n* | Print and Feed *n* Lines | 125 |
| 1B 65 *n* | Print and Reverse Feed *n* Lines | 125 |
| 1B 66 *m n* | Set Slip Paper Waiting Time | 118 |
| 1B 69 | Perform Full Knife Cut | 113 |
| 1B 6A *k* | Read from Non-Volatile Memory | 198 |
| 1B 6D | Perform Partial Cut | 114 |
| 1B 70 *n p1 p2* | Generate Pulse to Open Cash Drawer | 118 |
| 1B 73 *n1 n2 k* | Write to Non-Volatile Memory (NVRAM) | 198 |
| **1B 74 n** | **Select International Character Set** | **141** |
| 1B 75 0 | Transmit Peripheral Device Status | 155 |
| 1B 75 *n* | Request Alternate Status | 155 |
| 1B 76 | Transmit Paper Sensor Status | 156 |
| 1B 77 01 | Read MICR Data and Transmit | 188 |
| **1B 77 46** | **Check Flip** | **197** |
| 1B 77 50 | Define Parsing Format, Save in NVRAM | 188 |
| 1B 77 52 | Reread MICR Data | 188 |
| 1B 77 70 | Define Parsing Format, Do Not Save Permanently | 189 |
| 1B 7A *n* | Select or Cancel Parallel Printing Mode on R&J | 118 |
| 1B 7B n | Select or Cancel Upside Down Printing Mode | 142 |
| 1C | Select Slip Station | 119 |
| 1D 00 | Request Printer ID | 202 |
| 1D 01 | Return Segment Number Status of Flash Memory | 203 |
| 1D 02 *n* | Select Flash Memory Sector to Download | 203 |
| 1D 03 *n* | Real Time Request to Printer (DLE Sequence) | 169 |
| 1D 04 *n* | Real Time Status Transmission (GS Sequence) | 166 |
| 1D 05 | Real Time Printer Status Transmission | 170 |
| 1D 06 | Get Firmware CRC | 203 |
| 1D 07 | Return Microprocessor CRC | 204 |
| 1D 0E | Erase the Flash Memory | 204 |
| 1D 0F | Return Main Program Flash CRC | 204 |
| 1D 10 *n* | Erase Selected Flash Sector | 204 |
| 1D 11 *al ah cl ch d1…dn* | Download to Active Flash Sector | 205 |
| 1D 14 *n* | Reverse Feed *n* Lines | 125 |
| 1D 15 *n* | Reverse Feed *n* Dots | 126 |
| **1D 21 *n*** | **Select Character Size** | **143** |
| 1D 22 *n* | Select Memory Type (SRAM/Flash) Where to Save Logos or User-Defined Fonts | 199 |
| **1D 22 55 *n1 n2*** | **Flash Allocation** | **200** |

| Code (Hexadecimal) | Command | Page |
|---|---|---|
| 1D 23 n | Select the Current Logo (Downloaded Bit Image) | 149 |
| **1D 24 *nL nH*** | **Set Absolute Vertical Print Position in Page Mode** | **184** |
| 1D 2A *n1 n2 d1…d*n] | Define Downloaded Bit Image | 150 |
| 1D 2F *m* | Print Downloaded Bit Image | 152 |
| **1D 3A** | **Start or End Macro Definition** | **186** |
| 1D 40 *n* | Erase User Flash Sector | 201 |
| **1D 42 *n*** | **Select or Cancel White/Black Reverse Print Mode** | **144** |
| 1D 48 *n* | Select Printing Position for HRI Characters | 175 |
| 1D 49 *n* | Transmit Printer ID | 157 |
| 1D 49 40 *n* | Transmit Printer ID, Remote Diagnostics Extension | 158 |
| 1D 4C *nL nH* | Set Left Margin | 132 |
| 1D 50 *x y* | Set Horizontal and Vertical Minimum Motion Units | 126 |
| 1D 56 *m* | Select Cut Mode and Cut Paper | 119 |
| 1D 56 *m n* | Select Cut Mode and Cut Paper | 119 |
| 1D 57 *nL nH* | Set Printing Area Width | 133 |
| **1D 5C *nL nH*** | **Set Relative Vertical Print Position in Page Mode** | **185** |
| **1D 5E *r t m*** | **Execute Macro** | **187** |
| 1D 61 *n* | Select or Cancel Automatic Status Back | 171 |
| 1D 66 *n* | Select Pitch for HRI Characters | 175 |
| 1D 68 *n* | Select Bar Code Height | 175 |
| **1D 6B *m d1…*** | **Print Bar Code** | **176** |
| 1D 6B *m n d1…dn* | Print Bar Code | 176 |
| 1D 72 *n* | Transmit Status | 161 |
| 1D 77 *n* | Select Bar Code Width | 178 |
| 1D FF | Reboot Printer | 205 |
| 1E | Select Receipt Station | 120 |
| **1F 04 *n*** | **Convert 6 Dots/mm Bitmap to 8 Dots/mm Bitmap** | **153** |
| **1F 05 n** | **Select Superscript or Subscript Modes** | **145** |
| **1F 74** | **Print Test Form** | **120** |

## By Function

All items in **BOLD** are new or have additional functionality when compared to the A756.

### Printer Function Commands

| Code (Hexadecimal | Command | Page |
|---|---|---|
| 10 | Clear Printer | 112 |
| 11 | Close Form | 113 |
| 18 | Open Form | 113 |
| 19 | Perform Full Knife Cut | 113 |
| 1A | Perform Partial Knife Cut | 114 |
| 1B 07 | Generate Tone | 114 |
| 1B 3C | Return Home | 114 |
| 1B 3D | Select Peripheral Device (for Multi-Drop) | 114 |
| 1B 40 | Initialize Printer | 115 |
| 1B 43 n | Set Slip Paper Eject Length | 115 |
| 1B 63 30 n | Select Receipt or Slip for Printing; Slip for MICR Read | 115 |
| 1B 63 31 n | Select Receipt or Slip for Setting Line Spacing | 116 |
| **1B 63 33 n** | **Select Paper Sensors to Output Paper End Signals (Parallel Only)** | **116** |
| 1B 63 34 n | Select Sensors to Stop Printing | 117 |
| 1B 63 35 n | Enable or Disable Panel Buttons | 117 |
| 1B 63 36 n | Enable or Disable Online Switch | 117 |
| 1B 66 m n | Set Slip Paper Waiting Time | 118 |
| 1B 69 | Perform Full Knife Cut | 113 |
| 1B 6D | Perform Partial Knife Cut | 114 |
| 1B 70 n p1 p2 | Generate Pulse to Open Cash Drawer | 118 |
| 1B 7A n | Select or Cancel Parallel Printing Mode on R&J | 118 |
| 1C | Select Slip Station | 119 |
| 1D 56 m | Select Cut Mode and Cut Paper | 119 |
| 1D 56 m n | Select Cut Mode and Cut Paper | 119 |
| 1E | Select Receipt Station | 120 |
| **1F 74** | **Print Test Form** | **120** |

## Vertical Positioning and Print Commands

| Code (Hexadecimal | Command | Page |
|---|---|---|
| 0A | Print and Feed Paper One Line | 121 |
| 0C | Print and Return to Standard Mode/Print and Eject Slip | 121 |
| 0D | Print and Carriage Return | 121 |
| 14 n | Feed *n* Print Lines | 122 |
| 15 n | Feed *n* Dot Rows | 122 |
| 16 n | Add *n* Extra Dot Rows | 123 |
| 17 | Print | 123 |
| 1B 32 | Set Line Spacing to 1/6 Inch | 124 |
| 1B 33 n | Set Line Spacing | 124 |
| 1B 4A n | Print and Feed Paper | 124 |
| 1B 4B n | Print and Reverse Feed Paper | 125 |
| 1B 64 n | Print and Feed *n* Lines | 125 |
| 1B 65 n | Print and Reverse Feed *n* Lines | 125 |
| 1D 14 n | Reverse Feed n Lines | 125 |
| 1D 15 n | Reverse Feed n Dots | 126 |
| 1D 50 x y | Set Horizontal and Vertical Minimum Motion Units | 126 |

## Horizontal Positioning Commands

| Code (Hexadecimal | Command | Page |
|---|---|---|
| 09 | Horizontal Tab | 127 |
| 1B 14 n | Set Column | 127 |
| 1B 24 n1 n2 | Set Absolute Starting Position | 128 |
| 1B 44 [n] k 00 | Set Horizontal Tabs | 129 |
| 1B 5C n1 n2 | Set Relative Print Position | 129 |
| 1B 61 n | Select Justification | 131 |
| 1D 4C nL nH | Set Left Margin | 132 |
| 1D 57 nL nH | Set Printing Area Width | 133 |

## Print Characteristic Commands

| Code (Hexadecimal | Command | Page |
|---|---|---|
| 12 | Select Double-Wide Characters | 134 |
| 13 | Select Single-Wide Characters | 134 |
| 1B 12 | Select 90 Degree Counter-Clockwise Rotated Print | 134 |
| 1B 16 n | Select Pitch (Column Width) | 135 |
| 1B 20 n | Set Character Right-Side Spacing | 135 |
| 1B 21 n | Select Print Modes | 136 |
| 1B 25 n | Select or Cancel User-Defined Character Set | 137 |
| 1B 26 s c1 c2 d1…dn | Define User-Defined Characters | 137 |
| **1B 2D n** | **Select or Cancel Underline Mode** | **139** |
| 1B 3A 30 30 30 | Copy Character Set from ROM to RAM | 139 |
| 1B 3F n | Cancel User-Defined Characters | 139 |
| 1B 45 n | Select or Cancel Emphasized Mode | 140 |
| 1B 47 | Select Double Strike (A756 Emulation Mode) | 140 |
| 1B 47 n | Select Double Strike (A758 Native Mode) | 140 |
| 1B 48 | Cancel Double Strike | 141 |
| **1B 49 n** | **Select or Cancel Italic Print** | **141** |
| **1B 52 n** | **Select International Character Set** | **141** |
| 1B 55 n | Select or Cancel Unidirectional Printing Mode | 142 |
| 1B 56 n | Select or Cancel 90 Degrees Clockwise Rotated Print | 142 |
| 1B 74 n | Select International Character Set | 141 |
| 1B 7B n | Select or Cancel Upside Down Printing Mode | 142 |
| **1D 21 n** | **Select Character Size** | **143** |
| **1D 42 n** | **Select or Cancel White/Black Reverse Print Mode** | **144** |
| **1F 05 n** | **Select Superscript or Subscript Modes** | **145** |

## Graphics Commands

| Code (Hexadecimal | Command | Page |
|---|---|---|
| **1B (+*.bmp)** | **Download BMP Logo** | **146** |
| 1B 2A m n1 n2 d1…dn | Select Bit Image Mode | 146 |
| 1B 4C n1 n2 d1…dn | Select Double-Density Graphics (in A756 Emulation Mode) | 149 |
| 1B 59 n1 n2 d1…dn | Select Double-Density Graphics | 149 |
| 1D 23 n | Select Current Logo (Downloaded Bit Image) | 149 |
| 1D 2A n1 n2 d1…dn] | Define Downloaded Bit Image | 150 |
| 1D 2F m | Print Downloaded Bit Image | 152 |
| **1F 04 n** | **Convert 6 Dots/mm Bitmap to 8 Dots/mm Bitmap** | **153** |

## Status Commands

### Batch Mode

| Code (Hexadecimal | Command | Page |
|---|---|---|
| 1B 75 0 | Transmit Peripheral Device Status | 155 |
| 1B 75 n | Request Alternate Status | 155 |
| 1B 76 | Transmit Paper Sensor Status | 156 |
| 1D 49 n | Transmit Printer ID | 157 |
| 1D 49 40 n | Transmit Printer ID, Remote Diagnostics Extension | 158 |
| 1D 72 n | Transmit Status | 161 |

### Real Time

| Code (Hexadecimal | Command | Page |
|---|---|---|
| 10 04 n | Real Time Status Transmission (DLE Sequence) | 166 |
| 10 05 n | Real Time Request to Printer (GS Sequence) | 169 |
| 1D 03 n | Real Time Request to Printer (DLE Sequence) | 169 |
| 1D 04 n | Real Time Status Transmission (GS Sequence) | 166 |
| 1D 05 | Real Time Printer Status Transmission | 170 |

### Auto Status Back

| Code (Hexadecimal | Command | Page |
|---|---|---|
| 1D 61 n | Select or Cancel Auto Status Back | 171 |

## Barcode Commands

| Code (Hexadecimal | Command | Page |
|---|---|---|
| 1D 48 n | Select Printing Position for HRI Characters | 175 |
| 1D 66 n | Select Pitch for HRI Characters | 175 |
| 1D 68 n | Select Bar Code Height | 175 |
| **1D 6B m d1…dk 00**<br>**or**<br>**1D 6B m n d1…dn** | **Print Bar Code** | **176** |
| 1D 77 n | Select Bar Code Width | 178 |

## Page Mode Commands

| Code (Hexadecimal | Command | Page |
|---|---|---|
| **0C** | **Print and Return to Standard Mode/Print and Eject Slip** | **179** |
| **18** | **Cancel Print Data in Page Mode** | **179** |
| **1B 0C** | **Print Data in Page Mode** | **180** |
| **1B 4C** | **Select Page Mode** | **180** |
| **1B 53** | **Select Standard Mode** | **181** |
| **1B 54 n** | **Select Print Direction in Page Mode** | **182** |
| **1B 57 n1, n2…n8]** | **Set printing Area in Page Mode** | **183** |
| **1D 24 nL nH** | **Set Absolute Vertical Print Position in Page Mode** | **184** |
| **1D 5C nL nH** | **Set Relative Vertical Print Position in Page Mode** | **185** |

## Macro Commands

| Code (Hexadecimal | Command | Page |
|---|---|---|
| **1D 3A** | **Start or End Macro Definition** | **186** |
| **1D 5E r t m** | **Execute Macro** | **187** |

## MICR Check Reader Commands

### MICR Reading

| Code (Hexadecimal | Command | Page |
|---|---|---|
| 1B 77 01 | Read MICR Data and Transmit | 188 |
| 1B 77 52 | Reread MICR Data | 188 |

### MICR Parsing

| Code (Hexadecimal | Command | Page |
|---|---|---|
| 1B 77 50 | Define Parsing Format, Save in NVRAM | 188 |
| 1B 77 70 | Define Parsing Format, Do Not Save Permanently | 189 |

## Check Flip Commands

| Code (Hexadecimal | Command | Page |
|---|---|---|
| **1B 77 46** | **Check Flip Command** | **197** |

## User Data Storage Commands

| Code (Hexadecimal | Command | Page |
|---|---|---|
| 1B 27 m addr d1…dm | Write to User Data Storage | 198 |
| 1B 34 m addr | Read from User Data Storage | 198 |
| 1B 6A k | Read from Non-Volatile Memory | 198 |
| 1B 73 n1 n2 k | Write to Non-Volatile Memory (NVRAM) | 198 |
| 1D 22 n | Select Memory Type (SRAM/Flash) Where to Save Logos or User-Defined Fonts | 199 |
| **1D 22 55 n1 n2** | **Flash Allocation** | **200** |
| 1D 40 n | Erase User Flash Sector | 201 |

## Flash Download Commands

| Code (Hexadecimal | Command | Page |
|---|---|---|
| 1B 5B 7D | Switch Flash Download Mode | 202 |
| 1D 00 | Request Printer ID | 202 |
| 1D 01 | Return Segment Number Status of Flash Memory | 203 |
| 1D 02 n | Select Flash Memory Sector to Download | 203 |
| 1D 06 | Get Firmware | 203 |
| 1D 07 | Return Microprocessor CRC | 204 |
| 1D 0E | Erase the Flash Memory | 204 |
| 1D 0F | Return Main Program Flash CRC | 204 |
| 1D 10 n | Erase Selected Flash Sector | 204 |
| 1D 11 aL aH cL cH d1…dn | Download to Active Flash Sector | 205 |
| 1D FF | Reboot the Printer | 205 |

# Comparison to A756

## New Features

There are a number of new firmware features in the A758 Native Mode. These include:

♦ Page Mode on the receipt

♦ Additional Code pages

♦ Additional character attributes

♦ Flip

♦ More flexible handling of User-defined Characters and Logos (Downloadable Bit Image)

♦ Higher baud rates

♦ 8 High graphics on slip

♦ Macro capabilities

♦ Additional remote diagnostics

### Page Mode on the receipt

Normally the printer will print data as it is sent. In Page Mode, the data to be printed is composed on a page before printing. This composition process gives the application developer the ability to mix text, graphics and barcodes in different orientations and locations. Once the page composition process is completed, the page is printed. See the Page Mode commands in this section.

### Additional Code pages

The A758 includes support for the additional Code pages: CP852, CP858, CP860, CP863, CP865 and CP866.

### Additional character attributes

The A758 includes support for additional character attributes including Bold, Italics, Underline, Black/White Reverse Print, Superscript, Subscript, and Scaling.

### Flip

The A758 can flip a check on command.

### Additional flexibility when using User-defined Characters and Logos (Downloadable Bit Image)

The A758 can process User-defined Characters and Logos simultaneously. These items are stored in FLASH or SRAM, depending on the application developer's preferences.

### Barcodes

The A758 supports printing of one-dimensional barcodes on the slip station. The receipt station supports ladder barcodes and the addition of Code 93 and PDF417.

### FLASH Memory Allocation

The application developer has the ability to determine how the FLASH Memory is allocated between the User Data Storage and Logos/User-defined Characters.

### Higher Baud Rate

The A758 now supports serial communication rates of 57,600 and 115,200.

### 8 Dot High Graphics on Slip

In A758 Native Mode, the slip supports graphics that are 8 dots high. In A756 Emulation Mode, the graphics are 7 dots high.

### Macro Capability

The A758 supports the ability to record and execute a series of commands called a macro.

### Additional Remote Diagnostics

The A758 supports 5 additional remote diagnostics.

1. Number of Flash cycles
2. Number of knife jams
3. Numbers of cover openings
4. Maximum thermal printhead temperature
5. Number of slip lines printed

## Comparison Chart

The following table details the list of commands whose behavior differs from the A756 because of the physical differences of a 6 dots/mm head (A756) versus an 8 dots/mm head (A758).

| Command | Description | Difference between A756 and A758 configured in A756 Emulation Mode. |
|---|---|---|
| 15 *n* | Feed *n* Dot Rows | This command will move the paper on the receipt in n/203 inch steps instead of n/152 inch steps. |
| 16 *n* | Add *n* Extra Dot Rows | The dot rows will be measured in n/203 inches versus n/152 inches. |
| 1B 20 *n* | Set Right-Side Character Spacing | This command sets the right side spacing to "n" horizontal motion units. By default, these units are in terms of 1/203 inches versus 1/152 inches. |
| 1B 24 *n1 n2* | Set Absolute Starting Position | For graphics commands, the position is scaled to best match the previous product. In text mode, the equivalent character position is calculated. |
| 1B 26 *s c1 c2 n1 d1...nn dn*] | Define User-Defined Character Set | Since the dots on the new printhead are smaller, user-defined characters that were used on the previous printer will appear smaller on the new printer. |
| 1B 2A *m n1 n2 d1...dn* | Select Bit Image Mode | In A756 Emulation Mode, graphics are scaled to best match the size of the graphic in the previous printer. |
| 1B 33 *n* | Set Line Spacing | This command uses *n* in terms of n/360 inches. Since the previous product had a fundamental step of 1/180 inch and the new product has a fundamental step of 1/203 inch, the actual line spacing will not exactly match the requested spacing. |
| 1B 4A *n* | Print and Feed Paper | (Same as above) |
| 1B 59 *n1 n2 d1...dn* | Select Double-Density Graphics | In A756 Emulation Mode, the printer scales the graphics to provide the best match. |
| 1B 5C *n1 n2* | Set Relative Print Position | The parameter to this command is in units of dots. However, the command moves and aligns to character positions. In A756 Emulation Mode, this command calculates how many character positions to move based on the previous product's character width in dots (10) versus the current product (13). |
| 1B 61 *n* | Select Justification | This command does true dot resolution alignment for centering versus character-aligned centering. |
| 1D 2A *n1 n2 d1...dn*] | Define Downloaded Bit Image | In A756 Emulation Mode, this command scales the incoming data to provide a best match to the size of the image as it printed on the previous product. |
| 1D 2F *m* | Print Downloaded Bit Image | (Same as above) |

# Command Descriptions

## Printer Function Commands

The printer function commands control the following basic printer functions and are described in order of their hexadecimal codes:

♦   Station Select

♦   Platen Control

♦   Resetting the printer

♦   Cutting the paper

♦   Opening the cash drawers

### Clear Printer

**ASCII:**          DLE
**Hexadecimal**:   10
**Decimal:**        16

Clears the print line buffer without printing and sets the printer to the following condition:

♦   Receipt station is selected

♦   Double-Wide command (0x12) is cancelled

♦   Line Spacing, Pitch, and User-Defined Character Sets are maintained at current selections (RAM is not affected)

♦   Single-Wide, Single-High, Non-Rotated, and Left-Aligned characters are set

♦   Printer is restarted and error status is cleared in a fault condition

♦   Printing position is set to column one

♦   Slip platen is opened

♦   Slip printhead is homed

♦   Knife is homed

**Exceptions:**

In printers with the Parallel interface, this command also returns paper exhaust to the paper status line if an alternate status has been requested. A DLE command followed by an 04 or 05 is interpreted as a "real time command". (See Real Time commands)

### Close Form

**ASCII**:       DC1
**Hexadecimal**: 11
**Decimal:**     17

Closes the feed roller and platen (forms compensation arm assembly) and retracts the forms arm stop unconditionally. If the printer is reset or the Clear (0x10) is received, the feed roller and platen are opened.

This command executes if the platen is already closed. This command is processed regardless of which station is selected.

### Open Form

**ASCII**:       CAN
**Hexadecimal**: 18
**Decimal:**     24

When the printer is in A756 Emulation Mode or in A758 (Native) non-Page Mode, this command opens the feed roller and platen (forms compensation arm assembly) so that a form may be inserted (default position).

This command has the same code as the Cancel Print Data in Page Mode command, which is only executed in Page Mode.

This command executes if the platen is already open. This command is processed regardless of which station is selected.

### Perform Full Knife Cut

**ASCII**:       EM   or   ESC i
**Hexadecimal**: 19   or   1B 69
**Decimal:**     25   or   27 105

Cuts the receipt, leaving .20 inch (5 mm) of paper. This command is implemented the same as Partial Knife Cut (1A, 1B 6D). There are two codes for this command. Both codes perform the same function.

Line Feed is executed first if print buffer is not empty.

This command is processed regardless of which station is selected.

### Perform Partial Knife Cut

**ASCII**:        SUB   or   ESC m
**Hexadecimal**:   1A     or   1B 6D
**Decimal:**      26     or   27 109

Cuts the receipt, leaving 5 mm (.20 inch) of paper. This command is implemented the same as Full Knife Cut (19, 1B 69).

There are two codes for this command and both perform the same function.

**Exceptions:**

Line Feed is executed first if the buffer is not empty.

This command is processed regardless of which station is selected.

### Generate Tone

**ASCII**:        ESC BEL
**Hexadecimal**:   1B 07
**Decimal:**      27 7

Generates an audible tone. Performed by the printer to signal certain conditions.

### Return Home

**ASCII**:        ESC <
**Hexadecimal**:   1B 3C
**Decimal:**      27 60

Moves the impact printhead (unless already there) to the home position.

**Related Information:**

The printer is able to detect carriage motor jams, eliminating the need to home the printhead after each slip transaction.

### Select Peripheral Device (for Multi-Drop)

**ASCII**:        ESC = $n$
**Hexadecimal**:   1B 3D $n$
**Decimal:**      27 61 $n$

**Value of $n$:**    0 (bit 0), device not selected
                 1 (bit 0), device selected

**Default:**      1 (bit 0), device selected

Selects the device to which the host computer sends data.

**Exception:**

This command is ignored.

### Initialize Printer

**ASCII**:          ESC @
**Hexadecimal**:   1B 40
**Decimal:**        27 64

| **Default:** | <u>Receipt</u> | <u>Slip</u> |
|---|---|---|
| Character Pitch | 15.6 CPI | 13.9 CPI |
| Column Width | 44 characters | 66 characters |
| Extra Dot Rows | 2 | 3 |
| Character Set | Code Page 437 | Code Page 437 |
| Printing Position | Column One | Column One |

Clears the print line buffer and resets the printer to the default settings for the startup configuration (refer to Default settings above.)

Single-Wide, Single-High, Non-Rotated, and Left-Aligned characters are set and User-defined characters or logo graphics are cleared (Flash Memory is not affected). Tabs reset to default. Receipt selection state is selected.

**Exceptions:**

In printers with the Parallel interface, this command also returns paper exhaust to the paper status line if an alternate status has been requested.

### Set Slip Paper Eject Length

**ASCII**:          ESC C *n*
**Hexadecimal**:   1B 43 *n*
**Decimal:**        27 67 *n*

**Value of *n* :**     0 to 255

This command is ignored.

### Select Receipt or Slip for Printing; Slip for MICR Read

**ASCII**:          ESC c 0 *n*
**Hexadecimal**:   1B 63 30 *n*
**Decimal:**        27 99 48 *n*

**Value of *n* :**     1, 2, 3    Receipt selected

                4        Slip selected

**Default of *n* :**   1

Selects the station for printing. When slip is selected, the printer waits (based on the slip waiting time setting [ie: 1B 66 m n]) for the paper to be inserted. When slip has already been selected and the selection is changed, the form is opened.

If the station has already been selected and it is re-selected, no action takes place.

**Exceptions:**

Receiving the command discards unprinted data in the buffer, forcing a "beginning of line" state.

When *n* is out of range this command is ignored.

### Select Receipt or Slip for Setting Line Spacing

**ASCII**:           ESC c 1 *n*
**Hexadecimal**:   1B 63 31 *n*
**Decimal:**       27 99 49 *n*

**Value of *n*:**      1, 2, 3    Select receipt

                   4           Select Slip

**Default of *n* :**    1

Selects which station receives the effects of the following commands:

♦   Select Default Line Spacing (1B 32)

♦   Set Line Spacing (1B 33)

♦   Add *n* extra dot rows (16 *n*)

**Exceptions:**

This command is ignored if *n* is out of range.


### Select Paper Sensors to Output Paper End Signals (Parallel Only)

**ASCII**:           ESC c 3 *n*
**Hexadecimal**:   1B 63 33 *n*
**Decimal:**       27 99 51 *n*

**Value of *n* :**

If either bit 0 or bit 1 is on, the paper roll near-end sensor is selected as the paper sensor outputting paper-end signals.

If either bit 2 or bit 3 is on, the paper roll end sensor is selected as the paper sensor outputting paper-end signals.

| Bit | Position | Hex | Decimal | Function |
|-----|----------|-----|---------|----------|
| 0 | Off | 00 | 0 | Paper roll near end sensor disabled |
|   | On | 01 | 1 | Paper roll near end sensor enable |
| 1 | Off | 00 | 0 | Paper roll near end sensor disabled |
|   | On | 02 | 2 | Paper roll near end sensor enabled |
| 2 | Off | 00 | 0 | Paper roll end sensor disabled |
|   | On | 04 | 4 | Paper roll end sensor enabled |
| 3 | Off | 00 | 0 | Paper roll end sensor disable |
|   | On | 08 | 8 | Paper roll end sensor enabled |
| 4, 5, 6, 7 | - | - | - | Undefined |

**Range of *n* :**    1 - 255

**Default:**        15

Specifies the paper sensor to output a paper end signal. Multiple sensors may be selected to signal when paper has run out. When multiple sensors have been selected, anytime one of the sensors detects a paper end, the paper end signal is output.

When this command is executed a sensor is switched. The paper end signal switching is delayed depending on the receive buffer state.

### Select Sensors to Stop Printing

**ASCII**:          ESC c 4 $n$
**Hexadecimal**:    1B 63 34 $n$
**Decimal:**        27 99 52 $n$

**Value of $n$** :

| Bit of $n$ | |
|---|---|
| **Bit** | **Function** |
| Bit 0, 1 | Stop Receipt on Receipt Low |
| Bit 4 | Stop Slip if Trailing Edge Uncovered |
| Bit 5 | Stop Slip if Leading Edge Uncovered |

**Default:**        0

Determines which sensor stops printing on the respective station. The command does not affect the paper out sensor on the receipt station, which will automatically stop the printer when the paper is depleted.

### Enable or Disable Panel Buttons

**ASCII**:          ESC c 5 $n$
**Hexadecimal**:    1B 63 35 $n$
**Decimal:**        27 99 53 $n$

**Value of $n$ :**    0 = Enable
                    1 = Disable

**Default:**        0 (Enable)

Enables or disables the Paper Feed Button. If the last bit is 0, the Paper Feed Button is enabled. If the last bit is 1, the Paper Feed Button is disabled.

**Related Information:**

Functions that require using the Paper Feed Button (except for the Execute Macro [10 5E] command) cannot be used when it is disabled with this command.

### Enable or Disable Online Switch

**ASCII**:          ESC c 6 $n$
**Hexadecimal**:    1B 63 36 $n$
**Decimal:**        27 99 54 $n$

**Value of $n$ :**    0, 1

Since the A758 does not have an Online Switch, this command is ignored.

### Set Slip Paper Waiting Time

**ASCII**:            ESC f *m n*
**Hexadecimal**:   1B 66 *m n*
**Decimal:**         27 102 *m n*

**Value of *m* :**    Minutes
**Value of *n* :**    Tenths of seconds

Sets the time (in *m* minutes) that the printer waits for a slip to be inserted into the slip station. It also sets the time (*n* x 0.1 seconds) that the printer waits to close the platen and start printing once the slip has been inserted. The printer reads that a slip is inserted when the leading edge and trailing edge sensors are covered. The LED on the slip table is lit (green) when both sensors are covered.

If a slip is not inserted in the time specified, the receipt station is selected for the next function. If *m* = 0, the printer waits forever for a slip to be inserted. The times set by this command are used only by the command, Select Receipt or Slip for Printing, Slip for MICR Read (1B 63 30 *n*), with *n* set to 04.

### Generate Pulse to Open Cash Drawer

**ASCII:**           ESC p *n p*1 *p*2
**Hexadecimal:**   1B 70 *n p*1 *p*2
**Decimal:**         27 112 *n p*1 *p*2

**Value of *n* :**    0, 48 = Drawer 1
                    1, 49 = Drawer 2

**Value of *p1*:**    0 - 255
**Value of *p2*:**    0 - 255

Sends a pulse to open the cash drawer.

**Formulas:**

The value for either *p1* or *p2* is the hexadecimal number multiplied by 2 msec to equal the total time.

♦   On time = *p1* x 2 msec

♦   Off time = *p2* x 2 msec

**Related Information:**

The off-time is the delay before the printer performs the next operation.

Refer to cash drawer specifications for required on and off times.

### Select or Cancel Parallel Printing Mode on R&J

**ASCII**:            ESC z *n*
**Hexadecimal**:   1B 7A *n*
**Decimal:**         27 122 *n*

Because there is no journal station on the printer this command is not implemented and is ignored if received.

### Select Slip Station

**ASCII**:          FS
**Hexadecimal**:    1C
**Decimal:**        28

Selects the Slip Station for all functions. The receipt station is the default setting after the printer is initialized or the Clear Printer (0x10) command is received.

### Select Cut Mode and Cut Paper

**ASCII**:          GS V *m*        GS V *m n*
**Hexadecimal**:    1D 56 *m*       1D 56 *m n*
**Decimal:**        29 86 *m*       29 86 *m n*

**Value of *m***:   Selects the mode as shown in the table
**Value of *n* :**  Determines cutting position only if *m* is 65 or 66.

| M | Feed and Cut Mode |
|---|---|
| 0, 48 | Full cut (no extra feed). Partial cut on the A758. |
| 1, 49 | Partial cut (no extra feed). |
| 65 | Feeds paper to cutting position + (*n* times vertical motion unit), and cuts the paper completely. |
| 66 | Feeds paper to cutting position + (*n* times vertical motion unit), and performs a partial cut. |

**Range of *m*:**   0, 48; 1, 49
                    65, 66 (when used with *n*)

**Range of *n*:**   0 - 255

**Default of *n*:** 0
**Default of *m*:** 0

Selects a mode for cutting paper and cuts the paper. There are two formats for this command, one requiring one parameter *m*, the other requiring two parameters *m* and *n*. The format is indicated by the parameter *m.*

**Formulas:**       *n* times the vertical motion unit is used to determine the cutting position to which the paper is fed.

**Exceptions:**
If *m* is out of the specified range, the command is ignored.

## Select Receipt Station

**ASCII**:          RS
**Hexadecimal**:  1E
**Decimal:**        31

Selects the Receipt Station for all functions. The receipt station is the default setting after the printer is initialized or the Clear Printer (0x10) command is received.

## Print Test Form

**ASCII**:          AX t
**Hexadecimal**:  1F 74
**Decimal:**        31 116

Prints the current printer configuration settings on the receipt.

Disabled in page mode.

**Exception:**

This command is available in A758 Native Mode only.

# Vertical Positioning and Print Commands

The vertical positioning and print commands control the vertical print positions of characters on the receipt and slip.

### Print and Feed Paper One Line

**ASCII**:           LF
**Hexadecimal**:   0A
**Decimal:**         10

Prints one line from the buffer and feeds paper one line.

Carriage Return/Line Feed pair prints and feeds only one line.

### Print and Eject Slip

**ASCII**:           FF
**Hexadecimal**:   0C
**Decimal:**         12

Prints data from the buffer to the slip station and if the paper sensor is covered, reverses the slip out the front of the printer far enough to be accessible to the operator. The impact station opens the platen in all cases.

This command has the same code as the Print and Return to Standard Mode command, which is executed only when the printer is in Page Mode. When the printer is not in Page Mode this command executes the print and eject slip function.

**Exceptions:**

This command is ignored if the receipt station is the current station.

### Print and Carriage Return

**ASCII**:           CR
**Hexadecimal**:   0D
**Decimal:**         13

Prints one line from the buffer and feeds paper one line. The printer can be set through the configuration menu to ignore or use this command. Some applications expect the command to be ignored while others use it as print command.

**Related Information:**

See Ignoring/Using the Carriage Return in *Diagnostics* for more information.

Carriage Return/ Line Feed pairs prints and feeds only one line.

### Feed *n* Print Lines

**ASCII**:          DC4 *n*
**Hexadecimal**:   14 *n*
**Decimal:**       20 *n*

**Value of *n*:**      The number of lines to feed at current line height setting.

**Range of *n*** :     0 – 127  A756 Emulation Mode
                0 – 255  A758 Native Mode

Feeds paper *n* lines at the current line height without printing.

Ignored on receipt if the current line is not empty.

### Feed *n* Dot Rows

**ASCII**:          NAK *n*
**Hexadecimal**:   15 *n*
**Decimal:**       21 *n*

**Value of *n*:**      <u>Receipt</u>        <u>Slip</u>
                *n*/203 inch    *n*/72 inch

**Range of *n*** :     0 – 127  A756 Emulation Mode
                0 – 255  A758 Native Mode

Feeds paper *n* dot rows without printing. Receipt moves *n* rows if the print buffer is empty.

## Add *n* Extra Dot Rows

**ASCII**:        SYN *n*
**Hexadecimal**:  16 *n*
**Decimal:**      22 *n*

**Value of *n*:**   <u>Receipt</u>        <u>Slip</u>
                  *n*/203 inch      *n*/72 inch

**Range of *n*:**   0 - 12

**Default:**      <u>Receipt</u>        <u>Slip</u>
                  3                3

Adds *n* extra dot rows to the character height to increase space between print lines or decrease number of lines per inch.

**Formulas:**

The following table shows the relationship between the number of lines per inch and each extra dot row added for both the receipt and slip stations:

| Receipt Station | | | | Slip Station | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Extra Rows** | **Lines Per Inch** | **Dot Rows** | | **Extra Rows** | **Lines Per Inch** | **Dot Rows** |
| 0 | 8.47 | 24 | | 0 | 10.29 | 7 |
| 1 | 8.13 | 25 | | 1 | 9.00 | 8 |
| 2 | 7.81 | 26 | | 2 | 8.00 | 9 |
| **3** | **7.52** | **27** | | **3** | **7.20** | **10** |
| 4 | 7.25 | 28 | | 4 | 6.55 | 11 |
| 5 | 7.00 | 29 | | 5 | 6.00 | 12 |
| 6 | 6.77 | 30 | | 6 | 5.54 | 13 |
| 7 | 6.55 | 31 | | 7 | 5.14 | 14 |
| 8 | 6.35 | 32 | | 8 | 4.80 | 15 |
| 9 | 6.16 | 33 | | 9 | 4.50 | 16 |
| 10 | 5.98 | 34 | | 10 | 4.24 | 17 |
| 11 | 5.81 | 35 | | 11 | 4.00 | 18 |
| 12 | 5.64 | 36 | | 12 | 3.79 | 19 |

## Print

**ASCII**:        ETB
**Hexadecimal**:  17
**Decimal:**      23

Prints one line from the buffer and feeds paper one line. Executes LF on receipt. Executes LF on slip if previous character was not a CR.

### Set Line Spacing to 1/6 Inch

**ASCII**:        ESC 2
**Hexadecimal**:  1B 32
**Decimal:**      27 50

**Default:**      0.13 Inch (3.33 mm)

Sets the default line spacing to 1/6 of an inch (4.25 mm).

### Set Line Spacing

**ASCII**:        ESC 3 $n$
**Hexadecimal**:  1B 33 $n$
**Decimal:**      27 51 $n$

**Value of $n$:**    $n/406$ inches on receipt

$n/144$ inches in slip

**Range of $n$:**    0 – 255

**Default:**      <u>Receipt</u> .13 inch (3.37 mm or 7.52 lines per inch, 3 extra dot rows.)
<u>Slip</u>      .14 inch (7.2 lines per inch, 3 extra dot rows.)

Sets the line spacing for the receipt and for the slip. For the receipt the spacing is set to n/406 inches. For the slip, the line spacing is set to n/144 inches. The line spacing equals the character height when $n$ is too small.

If the Set Horizontal and Vertical Minimum Motion Units command (1D 50) is used to change the horizontal and vertical minimum motion unit, the parameters of this command (Set Line Spacing) will be interpreted accordingly.

**Related Information:**

For more information, see the description of the Set Horizontal and Vertical Minimum Motion Units command in this document.

### Print and Feed Paper

**ASCII**:        ESC J $n$
**Hexadecimal**:  1B 4A $n$
**Decimal:**      27 74 $n$

**Value of $n$:**    $n/203$ inches receipt

$n/144$ inches slip

**Range of $n$:**    0 - 255

Prints one line from the buffer and feeds the paper.

On the receipt station, the line height equals the character height when $n$ is too small. This does not apply to the slip station. Use $n = 0$ to print a line without feeding the paper. This allows the printer to print on the last line of the slip (at .59 inches from the trailing edge) and still retain the slip in the feed rollers for reverse feeding the paper back out of the slip station.

**Related Information:**

For more information, see the description of the Set Horizontal and Vertical Minimum Motion Units command in this document.

### Print and Reverse Feed Paper

**ASCII**:            ESC K *n*
**Hexadecimal**:   1B 4B *n*
**Decimal:**        27 75 *n*

**Value of *n*:**        <u>Slip</u> = *n*/144 of an inch

**Range of *n*:**        0 - 255

Prints one line from the buffer and reverse feeds the paper *n*/144 of an inch on the slip station.

**Exceptions:**

The receipt station cannot be reverse fed.

### Print and Feed *n* Lines

**ASCII**:            ESC d *n*
**Hexadecimal**:   1B 64 *n*
**Decimal:**        27 100 *n*

**Value of *n*:**        Number of lines to be printed and fed.

**Range of *n*:**        1 – 255
                   (0 is interpreted as 1 on the receipt station)

Prints one line from the buffer and feeds paper *n* lines at the current line height.

### Print and Reverse Feed *n* Lines

**ASCII**:            ESC e *n*
**Hexadecimal**:   1B 65 *n*
**Decimal:**        27 101 *n*

**Value of *n*:**        The number of lines on the slip station to be reverse fed.

**Range of *n*:**        0 – 255

Prints one line from the buffer and reverse feeds the paper *n* lines on the slip station. The receipt station cannot be reverse fed.

### Reverse Feed *n* Lines

**ASCII**:            GS DC4 *n*
**Hexadecimal**:   1D 14 *n*
**Decimal:**        29 20 *n*

**Range of *n* :**       0 – 127  A756 Emulation Mode
                   0 – 255  A758 Native Mode

Reverses the paper feed in the slip station by *n* lines at the current spacing. The next character feed command returns the paper feed back to the normal feed direction. This command is ignored if slip is not the selected station. Current spacing is not a factor.

### Reverse Feed *n* Dots

**ASCII**:          GS NAK *n*
**Hexadecimal**:   1D 15 *n*
**Decimal:**        29 21 *n*

**Value of *n*:**    *n* dots at 1/72 inch

**Range of *n* :**   0 – 127   A756 Emulation Mode
                     0 – 255   A758 Native Mode

Reverses the paper feed in the slip station by *n* dots at 1/72 inch (Axiohm 7150™ command). This command is ignored if receipt station is selected.

### Set Horizontal and Vertical Minimum Motion Units

**ASCII:**          GS P *x y*
**Hexadecimal:**   1D 50 *x y*
**Decimal:**        29 80 *x y*

**Value of *x*:**    Horizontal

**Value of *y*:**    Vertical

**Range of *x*:**    0 – 255

**Range of *y*:**    0-255

**Default: of *x*:**  203

**Default: of *y*:**  203

Sets the horizontal and vertical motion units to $1/x$ inch and $1/y$ inch respectively.

When $x$ or $y$ is set to 0, the default setting for that motion unit is used.

The default horizontal motion is $x = 203$.

# Horizontal Positioning Commands

The horizontal positioning commands control the horizontal print positions of characters on the receipt and slip.

### Horizontal Tab

**ASCII**:        HT
**Hexadecimal**:  09
**Decimal:**      9

Moves the print position to the next tab position set by the Set Horizontal Tab Positions (1B 44 $n1$ $n2$ ... 00) command. The print position is reset to column one after each line.

Tab treats the left margin as column one, therefore changes to the left margin will move the tab positions.

When there are no tabs defined to the right of the current position, or if the next tab is past the right margin, line feed is executed (both slip and receipt.) HT has no effect in page mode. Printer initialization sets 32 tabs at column 9, 17, 25, …

### Set Column

**ASCII**:        ESC DC4 $n$
**Hexadecimal**:  1B 14 $n$
**Decimal:**      27 20 $n$

| **Value of $n$**: | Receipt | Slip |
|---|---|---|
| | 1 - 44 (Standard) | 1 - 66 (Standard) |
| | 1 - 56 (Compressed) | 1 - 80 (Compressed) |

**Default of $n$:**   1

Prints the first character of the next print line in column $n$. It must be sent for each line not printed at column one. The value of $n$ is set to one after each line.

**Exceptions:**

The command cannot be used with Single- or Double-Density graphics.

### Set Absolute Starting Position

**ASCII:**            ESC $ *n1 n2*
**Hexadecimal:**   1B 24 *n1 n2*
**Decimal:**         27 36 *n1 n2*

**Value of *n*:**      Number of dots to be moved from the beginning of the line.

**Value of *n1*:**    Remainder after dividing *n* by 256.

**Value of *n2*:**    Integer after dividing *n* by 256.

The values for *n1* and *n2* are two bytes in low byte, high byte word orientation.

Sets the print starting position to the specified number of dots (up to the right margin) from the beginning of the line. The print starting position is reset to the first column after each line.

**Formulas:**

Determine the value of *n* by multiplying the column for the absolute starting position by 10 (slip, or receipt standard pitch) or 8 (receipt compressed pitch). The example shows how to calculate column 29 (10 dots per column) as the absolute starting position.

28 x 10 = 280 dots (beginning of column 29)
280/256 = 1, remainder of 24
*n1* = 24  *n2* = 1

**Related Information:**

This command is also used in the graphics mode on the receipt. See Graphics Commands in this chapter for more information.

If the Set Horizontal and Vertical Minimum Motion Units command (1D 50) is used to change the horizontal and vertical minimum motion unit, the parameters of this command (Set Absolute Print Position) will be interpreted accordingly. For more information, see the description of the Set Horizontal and Vertical Minimum Motion Units command (1D 50) in this document.

## Set Horizontal Tabs

**ASCII**:         ESC D *[n] k* NUL
**Hexadecimal**:  1B 44 *[n] k* 00
**Decimal:**       27 68 *[n] k* 0

**Value of *n*:**    Column for tab minus one.
                 *n* is always less than or equal to the current selected column
                 width.

**Value of *k*:**    0 - 32

**Default:**        Every 8 characters from column. 1 (9, 17, 25, etc.) for normal
                 print.

Sets up to 32 horizontal tab positions *n* columns from column one, but does not
move the print position. See the Horizontal Tab (09) command.

The tab positions remain unchanged if the character widths are changed after the
tabs are set. This command ends with hexadecimal 00; hexadecimal 1B 44 00
clears all tabs. Tabs assumed to be in strictly ascending order. A tab out of order
terminates the command string as if it were 00, and remaining tab values are
taken as normal data.

**Formulas:**

Set the tab positions in ascending order and put Hex 00 at the end.

Hex 1B 44 00 (number of tabs not specified) clears all tab positions.

**Exceptions:**

The tabs cannot be set higher than the column width of the current pitch.


## Set Relative Print Position

**ASCII:**         ESC \ *n1 n2*
**Hexadecimal:**  1B 5C *n1 n2*
**Decimal:**       27 92 *n1 n2*

**Value of *n*:**

To Move the Relative Starting Position Right of the Current Position by *n* dots:
     *n1* =        Remainder after dividing *n* by 256.
     *n2* =        Integer after dividing *n* by 256.

The values for *n*1 and *n*2 are two bytes in low byte, high byte word orientation.

To Move the Relative Starting Position Left of the Current Position by *n* dots:
     *n1* =        Remainder after dividing (65,536-*n*) by 256
     *n2* =        Integer after dividing (65,536-*n*) by 256

The values for *n*1 and *n*2 are two bytes in low byte, high byte word orientation.

Moves the print starting position the specified number of dots either right (up to
the right margin) or left (up to the left margin) of the current position. The print
starting position is reset to the first column after each line.

**Formulas:**

To move to the left:

Determine the value of $n$ by multiplying the number of columns to move left of the current position by 10 (slip or receipt standard pitch) or 8 (receipt compressed pitch). The example shows how to set the relative position two columns in standard pitch (10 dots per column) to the left of the current position.

2 x 10 = 20 dots (two columns to be moved left of the current position)
65,536-20 = 65516

65,516/256 = 255, remainder of 236
$n1 = 236$          $n2 = 255$

To move to the right:

Determine the value of $n$ by multiplying the number of columns to move right of the current position by 10 (slip or receipt standard pitch) or 8 (receipt compressed pitch). The example shows how to set the relative position two columns in standard pitch (10 dots per column) to the right of the current position.

2 x 10 = 20 dots (two columns to be moved right of the current position)
20/256 = 0, remainder of 20
$n1 = 20$  $n2 = 0$

**Related Information:**

If the Set Horizontal and Vertical Minimum Motion Units command (1D 50) is used to change the horizontal and vertical minimum motion unit, the parameters of this command (Set Relative Print Position) will be interpreted accordingly. For more information, see the description of the Set Horizontal and Vertical Minimum Motion Units command (1D 50) in this document.

**Compatibility Information (A758 receipt vs. A756 receipt)**

There is a difference in the normal behavior of this command in A758 Native Mode as compared to the original A756. The difference exists when the command is used to move to the left. The A756 processes the whole print string prior to putting it in the buffer for the print head. This method of processing allows the A756 to backup in the print string and replace characters and their associated attributes when a "Set Relative Print Position" command instructs the printer to move the print position to the left.

In order to improve the speed of printing, the A758 moves the data into a buffer for the printhead when it receives it. When the "Set Relative Print Position" command contains a move to the left, this causes the new data to overstrike the previous data. This behavior can be used to an application's advantage to provide the ability to create compound characters on the receipt station.

## Select Justification

**ASCII**:          ESC a *n*
**Hexadecimal**:    1B 61 *n*
**Decimal:**        27 97 *n*

**Value of *n*:**   0, 48 = Left Aligned
                    1, 49 = Center Aligned
                    2, 50 = Right Aligned

**Range of *n*:**   0 – 2, 48-50

**Default:**        0 (Left aligned)

Specifies the alignment of the characters, graphics, logos, and bar codes on the receipt station.

**Exceptions:**

The command is valid only when input at the beginning of a line.

### Set Left Margin

**ASCII**: GS L *nL nH*
**Hexadecimal**: 1D 4C *nL nH*
**Decimal**: 29 76 *nL nH*

**Range of *nL*:** 0 - 255

**Range of *nH*:** 0 - 255

**Default**: 576 dots (the maximum printable area)

Sets the left margin of the printing area. The left margin is set to ((($nH$ X 256) + $nL$) times horizontal motion unit) inches. The horizontal motion units are set by the Set Horizontal and Vertical Minimum Motion Units command (1D 50), described in this manual.

The width of the printing area is set by the Set Printing Area Width command (1D 57), which follows this command. See the Set Printing Area Width command (1D 57) in this document for a description of that command.

If the setting exceeds the printable area, the maximum value of the printable area is used. The maximum printable area is 576 dots. See the illustration.

**Formulas:**

To set the left margin to one inch at the default horizontal motion unit of 1/203 inches, send the four-byte string:

        GS  L  203  0

Or, to set the left margin to two inches at the default horizontal motion unit of 1/203 units per inch, send the four-byte string:

        GS  L  150  1

Where 2 inches = 406/203, and 406 = (1 X 256) + 150.

←——————————————— Printable area 576 dots————————————————————→

←——Left margin———→   ←———Printing area width————→
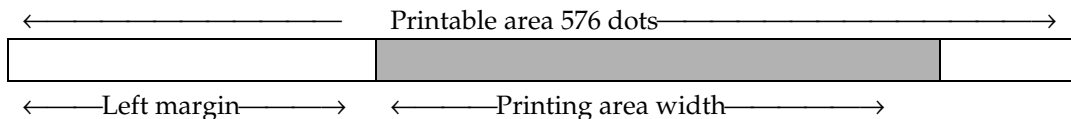
**Exceptions:**

The command is effective only at the beginning of a line.

This command is ignored if the line buffer is not empty, and only effects the Receipt interface.

### Set Printing Area Width

**ASCII**:           GS W *nL nH*
**Hexadecimal**:   1D 57 *nL nH*
**Decimal:**       29 87 *nL nH*

**Range of *nL*:**    0 – 255

**Range of *nH*:**    0 - 255

**Default:**        576 dots (the maximum printable area)

Sets the width of the printing area. If the setting exceeds the printable area, the maximum value of the printable area is used.

The width of the printing area is set to (((*nH* X 256) + *nL*) times horizontal motion unit) inches. The horizontal motion units are set by the Set Horizontal and Vertical Minimum Motion Units command (1D 50).

The width of the printing area follows the Set Left Margin command (1D 4C). See the Set Left Margin command (1D 4C…) earlier in this document for a description.

**Formulas:**

To set the width of the printing area to one inch at the default horizontal motion unit of 1/203 inches, send the four-byte string:

        GS   W   203   0

Or, to set the width of the printing area to two inches at the default horizontal motion unit of 1/203 units per inch, send the four-byte string:

        GS   W   150   1

Where 2 inches = 406/203, and 406 = (1 X 256) + 150.

←——————————————— Printable area 576 dots———————————————→

←——Left margin———→    ←———Printing area width—————→
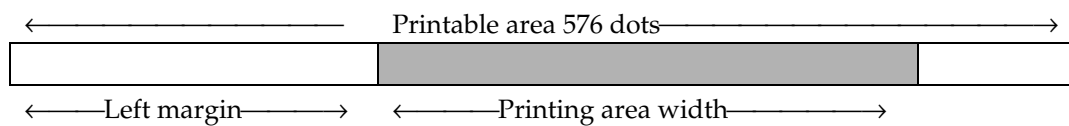
**Exceptions:**

This command is effective only at the beginning of a line.

If the setting exceeds the printable area, the maximum value of the printable area is used. The maximum printable area is 576 dots. See the illustration.

# Print Characteristic Commands

These commands control what the printed information looks like: selection of character sets, definition of custom-defined characters, and setting of margins. The commands are described in order of their hexadecimal codes

### Select Double-Wide Characters

**ASCII**:        DC2
**Hexadecimal**:  12
**Decimal:**      18

Prints double-wide characters. The printer is reset to single-wide mode after a line has been printed or the Clear Printer (0x10) command is received. Double-wide characters may be used in the same line with single-wide characters.

### Select Single-Wide Characters

**ASCII**:        DC3
**Hexadecimal**:  13
**Decimal:**      19

Prints single-wide characters. Single-wide characters may be used in the same line with double-wide characters.

### Select 90 Degree Counter-Clockwise Rotated Print

**ASCII**:        ESC DC2
**Hexadecimal**:  1B 12
**Decimal:**      27 18

Rotates characters 90 degrees counter-clockwise. The command remains in effect until the printer is reset or until a Clear Printer (0x10), Select or Cancel Upside-Down Print (1B 7B), or Select or Cancel Rotated Print (1B 56) command is received.

**Exceptions:**

This command is valid only at the beginning of a line.

Rotated print and non-rotated print characters cannot be used together in the same line.

**Related Information:**

See Summary of Rotated Printing in this chapter.

## Select Pitch (Column Width)

**ASCII**:         ESC SYN *n*
**Hexadecimal**:   1B 16 *n*
**Decimal:**       27 22 *n*

**Value of *n*:**   0 = Standard Pitch
                    1 = Compressed Pitch
**Default:**        0 (Standard pitch)

Selects the character pitch for a print line.

**Formulas:**

The following table provides the print characteristics for both pitches on the receipt and slip stations.

| Pitch | Receipt Columns | Receipt CPI | Slip Columns | Slip CPI |
|-------|-----------------|-------------|--------------|----------|
| Standard | 44 | 15.6 | 66 | 13.9 |
| Compressed | 56 | 20.3 | 80 | 17.1 |

**Related Information:**

See "Technical Specifications" for descriptions of character pitches (print modes).

## Set Character Right-Side Spacing

**ASCII**:         ESC SP *n*
**Hexadecimal**:   1B 20 *n*
**Decimal:**       27 32 *n*

**Range of *n*:**   0 - 32

**Default**:        0

Sets the right side character spacing to [*n* x horizontal or vertical motion units]. Values for this command are set independently in Standard and Page Mode.

The units of horizontal and vertical motion are specified by the Set Horizontal and Vertical Minimum Motion Units (1D 50…) command. Changes in the horizontal or vertical units do not affect the current right side character spacing. When the horizontal or vertical motion unit is changed by the Set Horizontal and Vertical Minimum Motion Units (1D 50…) command the value must be in even units and not less than the minimum amount of horizontal movement.

In Standard Mode the horizontal motion unit is used.

In Page Mode the horizontal or vertical motion unit differs and depends on the starting position of the printable area. When the starting printing position is the upper left or lower right of the printable area (set by Select Print Direction in Page Mode, 1B 54 n) the horizontal motion unit (*x*) is used. When the starting printing position is the upper right or lower left of the printable area (set by Select Print Direction in Page Mode, 1B 54 n) the vertical motion unit (*y*) is used.

**Exception:**

This command is ignored in A756 Emulation Mode and is only valid on the receipt station.

## Select Print Modes

**ASCII**:          ESC ! *n*
**Hexadecimal**:  1B 21 *n*
**Decimal:**       27 33 *n*

**Value of *n*:**   Pitch selection (standard, compressed, double high, or double wide.)

**Value of *n***

| Bit | Function | 0 | 1 |
|-----|----------|---|---|
| Bit 0 | Pitch | Standard Pitch[1] 44 Col/Line, 15.6 CPI (Rec) 66 Col/Line, 13.9 CPI (Slip) | Compressed Pitch 56 Col/Line, 20.3 CPI (Rec) 80 Col/Line, 17.1 CPI (Slip) |
| Bit 3 | Emphasized Mode | Canceled | Set |
| Bit 4 | Double-high[2] | Canceled | Set |
| Bit 5 | Double-wide | Canceled | Set |
| Bit 7 | Underlined Mode | Canceled | Set |

Bits 1, 2, 6 are not used.

[1]Standard and compressed pitch cannot be used together in the same line.
[2]Double-high characters cannot be used with normal characters in the same line, nor can they be used on the slip station.

**Default:**              0 (for bits 0, 3, 4, 5, 7)

Selects the print mode: standard, compressed, double high, or double wide.

**Related Information:**

The bits in this command perform the same function as the standalone functions:

| | |
|---|---|
| 1B 16 n | Select Pitch |
| 1B 45 n | Emphasized |
| 12 | Double-wide |
| 13 | Single-wide |
| 1B 2D n | Underline |

## Select or Cancel User-Defined Character Set

**ASCII**:          ESC % *n*
**Hexadecimal**:    1B 25 *n*
**Decimal:**        27 37 *n*

**Value of *n*:**   0= Code Page 437
                    1= User-defined (RAM character set)
                    2= Code Page 850

**Range:**          0 - 2

**Default:**        0 (Code Page 437)

Selects the character set. When an undefined RAM character is selected, the Code Page 437 character is used. See the *Printing Specification Guide* for the character sets.

**Exceptions:**

The character sets cannot be used together on the same line.


## Define User-Defined Characters

|               | Receipt                               | Slip                        |
|---------------|---------------------------------------|-----------------------------|
| **ASCII:**       | ESC & 3 *c*1 *c*2 *n*1 *d*1 ... *n*n *d*n | ESC & 0 *c*1 *c*2 *d*1 ... *d*n |
| **Hexadecimal:** | 1B 26 3 *c*1 *c*2 *n*1 *d*1 ... *n*n *d*n | 1B 26 0 *c*1 *c*2 *d*1 ... *d*n |
| **Decimal:**     | 27 38 3 *c*1 *c*2 *n*1 *d*1 ... *n*n *d*n | 27 38 0 *c*1 *c*2 *d*1 ... *d*n |

Defines and enters downloaded characters into RAM or Flash. The command may be used to overwrite single characters. User-defined characters are available until power is turned off or the Initialize Printer command (1B 40) is received.

Any invalid byte (*s*, *c*1, *c*2, *n*1) aborts the command.

User-defined character sets for both slip and receipt may be used at the same time. The command clears bit image logo data from RAM. The illustration below provides a sample of a character cell.


## Defining User-Defined Characters for the Slip and Receipt Station

Defines and enters downloaded characters into RAM.

Receipt Characters (1B 26 3)

Slip Characters (1B 26 0)

Top of Character

Top of Character
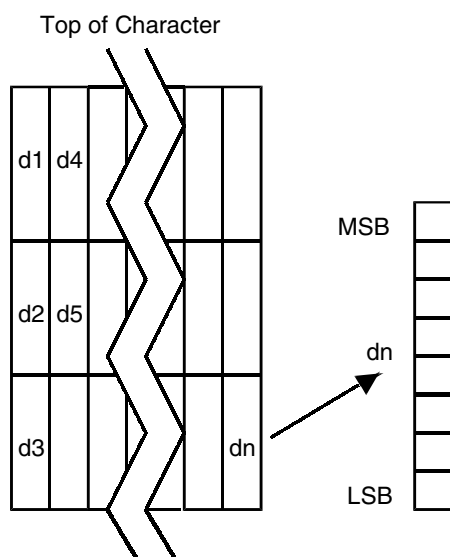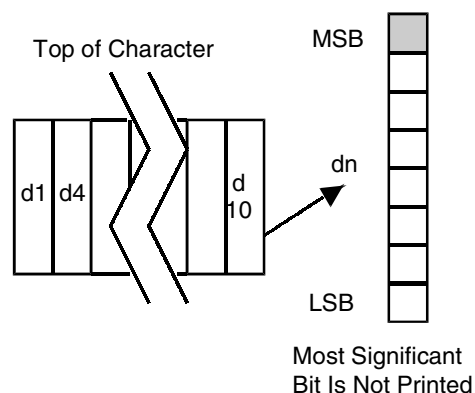


**Values and Ranges:**

Receipt

$c$ = the ASCII codes of the first ($c1$) and last ($c2$) characters respectively

    $c1$ = Hex 20-FF (Hex 20 is always printed as a space)
    $c2$ = Hex 20-FF (Hex 20 is always printed as a space)

To define only one character, use the same code for both $c1$ and $c2$.

$n$ = the number of dot columns for the nth character as specified by $n1 \ldots nn$

    $n$ = 1-10 (standard pitch), 12 and less accepted but ignored
    $n$ = 1-8 (compressed pitch), 12 and less accepted but ignored

$d$ = the column data for the nth character as specified by $d1 \ldots dn$

The number of bytes for a particular character cell is 3 x $n1$.

The bytes are printed down and across each cell.

Slip

$c$ = the ASCII codes of the first ($c1$) and last ($c2$) characters respectively

    $c1$ = Hex 20-FF (Hex 20 is always printed as a space)
    $c2$ = Hex 20-FF (Hex 20 is always printed as a space)

To define only one character, use the same code for both $c1$ and $c2$.

    $d$ = the column data for the nth character as specified by $d1 \ldots dn$

Each character is defined by 12 bytes (only bytes 2-11 are printed.)

Each byte is one 7-dot high column (full- or half-dot column.)

Overlapped dots are not printed

The data must contain [($c2$ - $c1$ + 1) x 12] bytes

**Related Information:**

See 1D 22 $n$ (Select Memory Type Where to Save User-Defined Fonts.)

## Select or Cancel Underline Mode

**ASCII**:             ESC - *n*
**Hexadecimal**:    1B 2D *n*
**Decimal:**         27 45 *n*

**Value of *n*:**     0, 48 = Cancel underline mode
                   1, 49 = Select underline mode

**Default of *n*:**   0 (Cancels underline mode)

Turns underline mode on or off. Underlines cannot be printed for spaces set by the Horizontal Tab, Set Absolute Start Position, or Set Relative Print Position commands.

This command and the Select Print Mode(s) command (1B 21) turn underline on and off in the same way.

**Exceptions:**

This command is ignored if *n* is out of the specified range.

This command is only available in A758 Native Mode.

## Copy Character Set from ROM to RAM

**ASCII**:             ESC : 0 0 0
**Hexadecimal**:    1B 3A 30 30 30
**Decimal:**         27 58 48 48 48

**Default:**          Code Page 437

Copies characters in the active ROM set to RAM. Use this command to re-initialize the User-Defined Character Set. Code Page 437 is copied by default at initialization.

The command is ignored if current font is the user font.

**Related Information:**

To modify characters in one of the character set variations, such as Rotated Print, select one of the Rotated Print commands, copy to RAM, then use the Define User-Defined Character Set command (1B 26).

## Cancel User-Defined Characters

**ASCII**:             ESC ? *n*
**Hexadecimal**:    1B 3F *n*
**Decimal:**         27 63 *n*

**Value of *n*:**     Specified character code

**Range of *n*:**     32 - 255

Cancels the pattern defined for the character code specified by *n*. After the user-defined character is canceled, the corresponding pattern from Code Page 437 is printed.

**Exceptions:**

This command is ignored if *n* is out of range or if the user-defined character is not defined.

## Select or Cancel Emphasized Mode

**ASCII**:           ESC E *n*
**Hexadecimal**:   1B 45 *n*
**Decimal:**        27 69

**Value of *n*:**    0 (bit 0), not selected
                   1 (bit 0), selected

**Range of *n*:**    0 - 255

**Default:**        0 (bit 0)

Starts or stops emphasized printing on slip and receipt. In Emphasized Mode on the slip, each line is printed twice to improve penetration of multi-part forms and increase print contrast. The second pass is printed the same direction as the first to ensure accuracy of the overprint. Printing speed decreases due to the second printing pass.

**Exceptions:**

Only the lowest bit of *n* is effective.

Emphasized printing cannot be used with bit-images or downloaded bit-images.

**Related Information:**

This command and the Select Print Mode(s) command (1B 21) function identically.

## Select Double Strike

|                | A756 Emulation | A758 Native |
| -------------- | -------------- | ----------- |
| **ASCII**:     | ESC G          | ESC G n     |
| **Hexadecimal**: | 1B 47        | 1B 47 n     |
| **Decimal:**   | 27 71          | 27 71 n     |
| **Value of *n*:** | 0 = Off     |             |
|                | 1 = On         |             |

Turns double strike mode on for the slip station. Overprints a second pass of the print line on the slip station to improve penetration of multi-part forms and increase print contrast. The second pass is printed the same direction as the first to ensure accuracy of the overprint. The printer is reset to the standard print mode after a line has been printed or after a Clear Printer (0x10) command is received.

**Exceptions:**

The settings do not apply in Page Mode. However they can be set or cleared in Page Mode.

Double-strike printing cannot be used with bit-images or downloaded bit-images.

This command functions the same as the A756 when the printer is in A756 Emulation Mode. In Native Mode, the command takes a parameter to enable and disable it.

**Related Information:**

Printer output is the same as in Emphasized Mode.

### Cancel Double Strike

**ASCII**:          ESC H
**Hexadecimal**:   1B 48
**Decimal:**       27 72

Turns off double strike mode on the slip station in A756 Emulation Mode.

This command is ignored in the A758 Native Mode.

This command works on both slip and receipt stations.

### Select or Cancel Italic Print

**ASCII**:          ESC I *n*
**Hexadecimal**:   1B 49 *n*
**Decimal:**       27 73 *n*

**Value of *n*:**    0 = Off
                    1 = On

                    (When 0 and 1 are the Least Significant Bit, LSB)

**Default:**        0 (Off)

Turns Italic print mode on or off. This command is only available in A758 Native Mode. Italic print mode is available for built-in, user-defined characters. This command only works on the receipt station.

**Exceptions:**

Only the lowest bit of *n* is valid. This command is only valid for the receipt station in A758 Native Mode.

### Select International Character Set

**ASCII**:          ESC R *n*          ESC t *n*
**Hexadecimal**:   1B 52 *n*          1B 74 *n*
**Decimal:**       27 82 *n*          27 116 *n*

| | A758 Native Mode | A756 Emulation |
|---|---|---|
| **Value of *n*:** | 0 = Code Page 437 | 0 = Code Page 437 |
| | 1 = Code Page 850 | 1 = Code Page 850 |
| | 2 = Code Page 852 | |
| | 3 = Code Page 860 | |
| | 4 = Code Page 863 | |
| | 5 = Code Page 865 | |
| | 6 = Code Page 858 | |
| | 7 = Code Page 866 | |

**Default:**        0 (Code Page 437)

Selects the character set to be used. See *Print Specifications* for the character sets.

There are two codes for this command. Both codes perform the same function.

**Exceptions:**

The character sets cannot be used together on the same line.

**Related Information:**

This command may also be known as Select Character Code Table.

### Select Character Code Table

See the previous command, Select International Character Set.

### Select or Cancel Unidirectional Printing Mode

**ASCII**:          ESC U *n*
**Hexadecimal**:   1B 55 *n*
**Decimal**:        27 85 *n*

**Value of *n*:**   0 = select bi-directional
                    1 = select unidirectional
**Default**:        0

Toggles between unidirectional and bi-directional printing on the slip station. Unidirectional printing increases column alignment and provides higher quality printing. Printing is normally bi-directional because of the faster speed.

### Select or Cancel 90 Degrees Clockwise Rotated Print

**ASCII**:          ESC V *n*
**Hexadecimal**:   1B 56 *n*
**Decimal**:        27 86 *n*

**Value of *n*:**   0 = Cancel
                    1 = Set

**Default**:        0

Rotates characters 90 degrees clockwise. The command remains in effect until the printer is reset or the Clear Printer (0x10) command is received. See Summary of Rotated Printing in this chapter.

### Select or Cancel Upside Down Printing Mode

**ASCII**:          ESC { *n*
**Hexadecimal**:   1B 7B *n*
**Decimal**:        27 123 *n*

**Value of *n*:**   0 = Cancel
                    1 = Set

**Default**:        0 (Cancel)

Prints upside-down characters. The character order is inverted in the buffer so text is readable. The command remains in effect until the Rotated Print (1B 12) command is received. Only bit 0 is used. Bits 1-7 are not used. See Summary of Rotated Printing in this document for more information.

**Exceptions:**

The command is valid only at the beginning of a line.
The Rotated Print command (1B 12) cancels this command.

### Select Character Size

**ASCII**:          GS ! *n*
**Hexadecimal**:    1D 21 *n*
**Decimal:**        29 33 *n*

**Value of *n*:**   1 - 8 = vertical number of times normal font
                    1 – 8 = horizontal number of times normal font

**Range of *n*:**   00 – 07, 10 – 17, … 70 – 77

**Default of *n*:** 0

Selects the character height using bits 0 to 2 and selects the character width using bits 4 to 7, as follows:

| Character Width Selection | | |
|------|---------|------|
| Hex | Decimal | Width |
| 00 | 0 | 1 (normal) |
| 10 | 16 | 2 (two times width) |
| 20 | 32 | 3 (three times width) |
| 30 | 48 | 4 (four times width) |
| 40 | 64 | 5 (five times width) |
| 50 | 80 | 6 (six times width) |
| 60 | 96 | 7 (seven times width) |
| 70 | 112 | 8 (eight times width) |

| Character Height Selection | | |
|------|---------|------|
| Hex | Decimal | Height |
| 00 | 0 | 1 (normal) |
| 01 | 1 | 2 (two times height) |
| 02 | 2 | 3 (three times height |
| 03 | 3 | 4 (four times height) |
| 04 | 4 | 5 (five times height) |
| 05 | 5 | 6 (six times height) |
| 06 | 6 | 7 (seven times height) |
| 07 | 7 | 8 (eight times height) |

This command is effective for all characters (except for HRI characters).

In Standard Mode, the vertical direction is the paper feed direction, and the horizontal direction is perpendicular to the paper feed direction. However, when character orientation changes in 90 degree clockwise-rotation mode, the relationship between vertical and horizontal directions is reversed.

In Page Mode, vertical and horizontal direction are based on the character orientation. When characters are enlarged with different sizes on one line, all the characters on the line are aligned at the baseline.

The Select Print Mode (1B 21 n) command can also select or cancel double-width and double-height modes. However, the setting of the last received command is effective.

(Select Character Size—continued on the next page)

**Exceptions:**

If *n* is out of the defined range, this command is ignored. This command is only valid for the receipt station.

This is only available in A758 Native Mode.

## Select or Cancel White/Black Reverse Print Mode

**ASCII**:          GS B *n*
**Hexadecimal**:  1D 42 *n*
**Decimal:**      29 66 *n*

**Value of *n*:**   0 = Off
                   1 = On
                   (Only the lowest bit is used.)

**Range of *n*:**   0 – 255

**Default of *n*:**  0 (Off)

Turns on White/Black reverse printing mode. This command is only available in A758 Native Mode. In White/Black reverse printing mode, print dots and non-print dots are reversed, which means that white characters are formed by printing a black background. When the White/Black reverse printing mode is selected it is also applied to character spacing which is set by Right-Side Character Spacing (1B 20).

This command can be used with built-in characters and user-defined characters, but does not affect the space between lines.

White/Black Reverse Print Mode does not affect bit image, downloaded bit image, bar code, HRI characters, and spacing skipped by Horizontal Tab (09), Set Absolute Starting Position (1B 24…), and Set Relative Print Position (1B 5C).

White/Black reverse mode has a higher priority than Underline Mode. When Underline Mode is on and White/Black Reverse Print Mode is selected, Underline Mode is disabled, but not canceled.

**Exceptions:**

This command is only valid on the receipt station.

This is only available in A758 Native Mode.

**Select Superscript or Subscript Modes**

**ASCII:**          AX ENQ *n*
**Hexadecimal:**  1F 05 *n*
**Decimal:**       31 05 *n*

**Value of *n*:**   0 = Normal character size
                    1 = Select subscript size
                    2 = Select superscript size

**Default:**        0 (normal size)

Turns superscript or subscript modes on or off. This attribute may be combined with other characters size settings commands ( 12, 13, 1B 21 *n*, 1D 21 *n*, …)

This command is only available on the receipt station in A758 Native Mode.

**Exceptions:**

This command is ignored if *n* is out of the specified range.

This is only available in A758 Native Mode.

**Summary of Rotated Printing**

The table shows the combinations of Set/Cancel Upside-Down Print, Set/Cancel Rotated Print (clockwise), and Rotated Print (counterclockwise). Rotated CCW is mutually exclusive with the other two commands. Unintended consequences may result when rotated CCW is mixed with other commands.

The samples of the print show only the normal size characters. Double-wide and double-high characters are printed in the same orientation (double-high characters cannot be printed on the slip station). They may also be mixed on the same line.

| Upside Down (1B 7B *n*) | Rotated CW (1B 56 *n*) | Rotated CCW (1B 12) | Resulting Output |
|---|---|---|---|
| Canceled | Canceled | Cleared | A B C |
| Canceled | Set | X | ∀ ᗺ Ɔ |
| Set | Canceled | X | Ɔ ᗺ ∀ |
| Set | Set | X | Ɔ ᗺ ∀ |
| X | X | Set | ∀ ᗺ Ɔ |

**Note:**    The following print modes cannot be mixed on the same line:

♦   Standard and compressed pitch

♦   Vertical (normal) and rotated

♦   Right-side up and upside down

♦   Single high (normal) and double high

# Graphics Commands

These commands are used to enter and print graphics data and are described in order of their hexadecimal codes.

## Download BMP Logo

**ASCII:**        ESC (+*.BMP file)
**Hexadecimal:**  1B (+*.BMP file)
**Decimal:**      27 (+*.BMP file)

**Value:**        Maximum width =        576
                  Maximum height =       512

Enters a BMP file into RAM or Flash.

This command is used by sending the file data of a monochrome BMP file preceded by a 0 x 1B. The bit map is stored in the printer in the same manner as a down loaded bit image.

The downloaded BMP file can be printed by using the Print Downloaded Bit Image (1D 2F m) command.

**Exceptions:**

BMP file images that are not monochrome are ignored. This command is only valid for the receipt station.

This is only available in A758 Native Mode.

**Related Information:**

See 1D 22 n (Select Memory Type to save logos.)

## Select Bit Image Mode

**ASCII:**        ESC * *m* *n*1 *n*2 *d*1 ... *d*n
**Hexadecimal:**  1B 2A *m* *n*1 *n*2 *d*1 ... *d*n
**Decimal:**      27 42 *m* *n*1 *n*2 *d*1 ... *d*n

Sets the print resolution and enters one line of graphics data into the print buffer. Excess data is accepted but ignored. Any print command is required to print the data, after which the printer returns to normal processing mode.

See the illustration graphic representation of the bit image.

In A756 Emulation Mode, slip graphics are only 7- bit (MSB not printed.) In A758 Native Mode, slip graphics are 8-bit.

(Select Bit Image Mode—continued on the next page)

**Values**:

Receipt Station

| Value of *m* | Mode | No. of Dots (Vertical) | No. of Dots (Horizontal) | Number of Dots/Line |
|---|---|---|---|---|
| 0 | 8 Dot Single Density | 8 (68 DPI) | 0 – 288 (101 DPI) | 8 x 288 |
| 1 | 8 Dot Double Density | 8 (68 DPI) | 0 – 576 (203 DPI) | 8 x 576 |
| 32 | 24 Dot Single Density | 24 (203 DPI) | 0 – 288 (101 DPI) | 24 x 288 |
| 33 | 24 Dot Double Density | 24 (203 DPI) | 0 – 576 (203 DPI) | 24 x 576 |

Slip Station

| Value of *m* | Mode | No. of Dots** (Vertical) | No. of Dots (Horizontal) | Number of Dots/Line |
|---|---|---|---|---|
| 0 | 7 Dot Single Density | 7 (72 DPI) | 330 (69.5 DPI) | 7 x 330 |
| 1* | 7 Dot Double Density | 7 (72 DPI) | 660 (139 DPI) | 7 x 660 |
| 32, 33 | Not Available on Slip | | | |

In single density, one byte (7 dots) is printed in each full dot column; in double density, one byte is printed in each half/full dot column.

*Adjacent horizontal dots (overlapping dots) are not printed on the slip.

**In A758 Native Mode. There are 8 vertical dots.

| Value of *n* (8-Dot Single-Density Mode) | Value of *n* (24-Dot Single-Density Mode) | Value of *d* |
|---|---|---|
| n1 + (256 x n2) | 3 x [n1 + (256 x n2)] | Number of Bytes of Data* |

*Printed left to right (8-dot mode); Printed down then across (24-dot mode).

**Formulas:**

|  |  |
|---|---|
| 8 Dot Single Density | $n1 + (256 \times n2)$ |
| 24 Dot Single Density | $3 \times [n1 + (256 \times n2)]$ |

(Select Bit Image Mode—continued on the next page)

8-Dot Single-Density Mode—Receipt and Slip

Top of Bit Image

Receipt      Slip

MSB          MSB

d1 d2 d3 d4                          dn         dn          dn          dn

LSB          LSB

Most Significant
Bit Is Not Printed
In A756 Em lation

24-Dot Single-Density Mode—Receipt Only

Top of Bit Image

d1 d4 d7

MSB

d2 d5

dn          dn

d3 d6                                dn

LSB
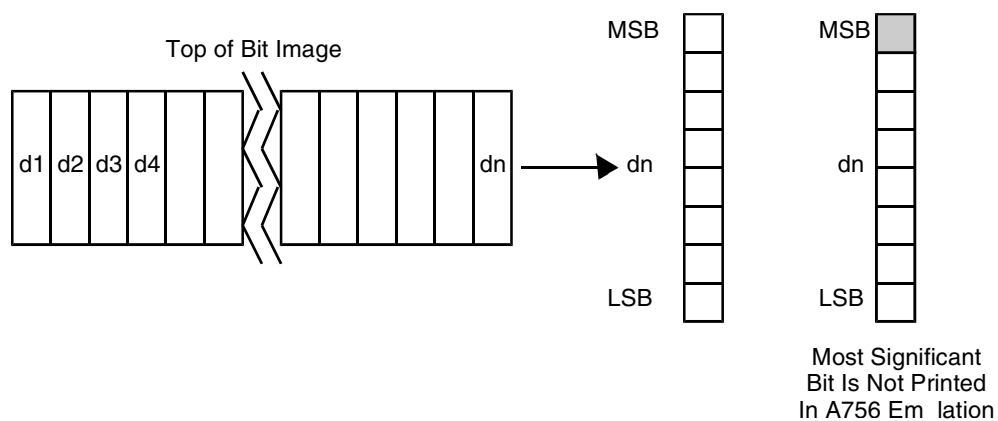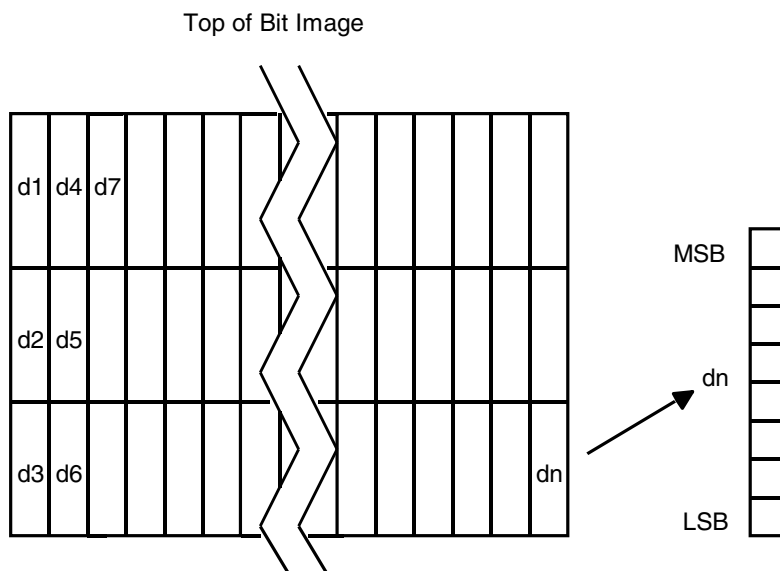
## Select Double-Density Graphics

**ASCII:**          ESC Y $n1$ $n2$ $d1$ … $d$n     or     ESC L $n1$ $n2$ $d1$ ... $d$n
**Hexadecimal:**  1B 59 $n1$ $n2$ $d1$ ... $d$n    or     1B 4C $n1$ $n2$ $d1$ … $d$n
**Decimal:**     27 89 $n1$ $n2$ $d1$ ... $d$n    or     27 76 $n1$ $n2$ $d1$ ... $d$n

**Value of $n$:**

| Value of $n$ (8-Dot Single Density Mode) | Value of $n$ (24-Dot Single Density Mode) | Value of $d$ |
|---|---|---|
| $n1 + (256 \times n2)$ | $3 \times [n1 + (256 \times n2)]$ | Number of Bytes of Data (Printed Down, Then Across) |

Enters one line of 7 (slip in A756 mode) or 8-dot double-density graphics into the print buffer. Any print command is required to print the line, after which the printer returns to normal processing mode. The number of bytes sent is represented by the formulas in the table.

Each bit corresponds to one horizontal dot. Compare to Set Bit Image Mode (1B 2A, m=1) earlier in this document.

**Exception:**

1B 4C $n1$ $n2$ $d1$ … $d$n is only valid in A756 Emulation Mode.

## Select the Current Logo (Downloaded Bit Image)

**ASCII:**          GS # $n$
**Hexadecimal:**  1D 23 $n$
**Decimal:**     29 35 $n$

**Range of $n$:**    0 – 255

Selects a logo to be defined or printed. The active logo $n$ remains in use until this command is sent again with a different logo $n$.

When this command precedes a logo definition, that definition is stored in Flash Memory as logo $n$. If there is already a different definition in Flash Memory for logo $n$, the first is inactivated and the new definition is used. The inactive definition is not erased from Flash and continues to take up space in Flash Memory.

When this command precedes a logo print command and $n$ is different from the previously active logo selected, the printer retrieves the logo definition for $n$ from Flash Memory and prints it. If there is no definition for logo $n$, then no logo is printed.

In the case of a previously existing application that expects only one possible logo, the printer will not receive the Select Current Logo (1D 23 $n$) command. In this case, the printer assigns 0 as the active logo identifier. It automatically stores any new logo definition in Flash Memory as logo 0, inactivating any previous logo 0 definition. If the Flash Memory space available for logos fills up with inactive logo 0 definitions, the firmware erases the old definitions at the next power cycle. This is the only case in which the printer erases Flash Memory without an application command.

In the case of a new application using multiple logos, the Select Current Logo (1D 23 $n$) command is used. After that, the printer no longer automatically erases the logo definition Flash Memory page when it fills with multiple definitions. A new application using multiple logos, writing a user-defined character set into Flash

Memory, or both, is responsible for erasing the logo and user-defined character set Flash Memory page when the logo area is full or before a new character set is defined.

**Exceptions:**

This command is only valid for the receipt station. However, it will be processed correctly regardless of whether the receipt station is currently selected.

### Define Downloaded Bit Image

**ASCII:**        GS * *n*1 *n*2 *d*1 ... *d*n]
**Hexadecimal:**  1D 2A *n*1 *n*2 *d*1 ... *d*n]
**Decimal:**      29 42 *n*1 *n*2 *d*1 ... *d*n

**Value of *n1*:**  See the following table.
**Value of *n2*:**  See the following table.
**Value of *d*:**   See the following table.

| Value of *n*1 | Value of *n*2 | Value of *d* |
| --- | --- | --- |
| 1-56 (8 x *n*1 = Number of Horizontal Dot Columns) | 1-64 (Number of Vertical Bytes)* | Bytes of Data (Printed Down Then Across) |

*The number of bytes sent is represented by the following formula:

$n = 8 \times n1 \times n2$ ($n1 \times n2$ must be less than or equal to 4608).

Enters a downloaded bit image (such as a logo) into RAM or Flash with the number of dots specified by *n*1 and *n*2 in A756 Emulation, unless loaded into Flash. The downloaded bit image is available until power is turned off, another bit image is defined, or either Initialize Printer (1B 40), or Define User-Defined Character Set (1B 26), command is received.

By default, A756 Emulation loads downloaded bit image to SRAM, while A758 Native Mode loads them to Flash.

See the illustration on the following page for a graphic representation of the downloaded bit image.
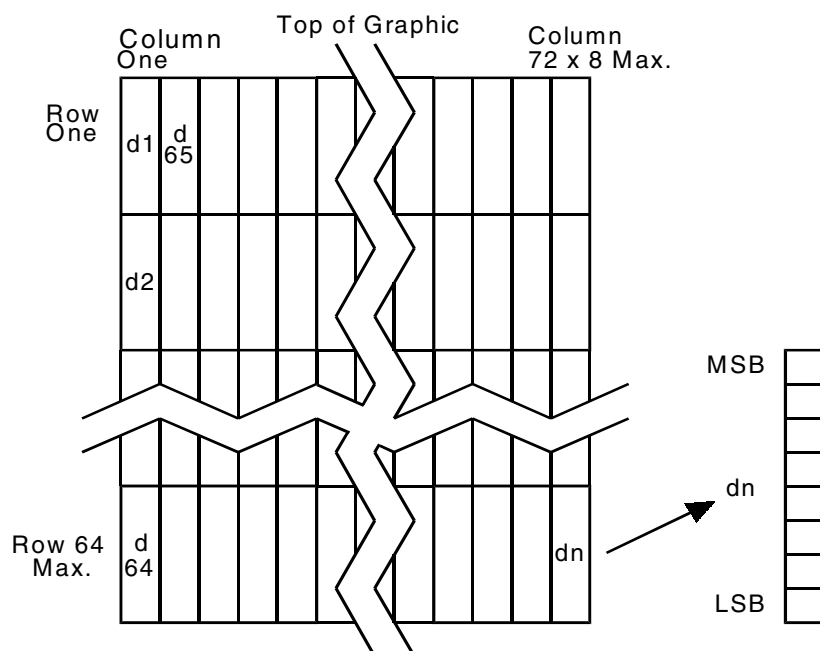
**Exceptions:**

See the illustration for the Print Downloaded Bit Image command (1D 2F) for a representation of the bit image.

**Related Information:**

See 1D 22 n (Select Memory Type to store logos) and 1D 23 n (Select the Current Logo.)

## Print Downloaded Bit Image

**ASCII**:           GS / *m*
**Hexadecimal**:    1D 2F *m*
**Decimal:**         29 47 *m*

**Value and Range of *m*:**

| Value of *m* | Print Mode | Vertical DPI[1] | Horizontal DPI* |
|---|---|---|---|
| 0 | Normal | 203 | 203 |
| 1 | Double Wide | 203 | 101 |
| 2 | Double High | 101 | 203 |
| 3 | Quadruple | 101 | 101 |

[1]Dot density measured in dots per inch

Prints a downloaded bit image in RAM or Flash on the receipt station at a density specified by *m*. It is ignored if any data is in the print buffer, if the downloaded bit image is undefined, or if the data defined exceeds one line.

See the illustration for a representation of the bit image.
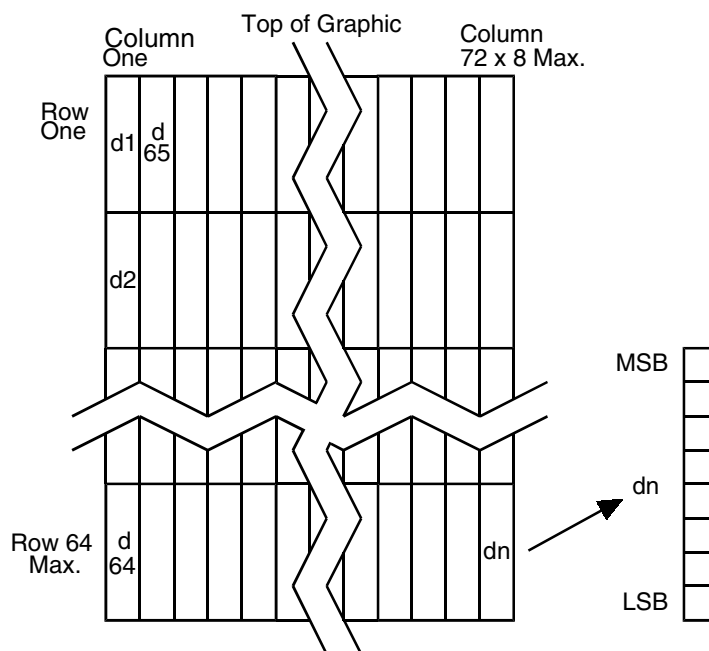


**Related Information:**

See 1D 22 n (Select Memory Type to store logos) and 1D 23 n (Select the Current Logo.)

### Convert 6 Dots/mm Bitmap to 8 Dots/mm Bitmap

**ASCII:**          AX EOT *n*
**Hexadecimal:**  1F 04 *n*
**Decimal:**      31 04 *n*

**Value:**          0 = Off
                    1 = On

**Default:**        0 (Off)

Selects or cancels 6 dot/mm in A756 Emulation Mode.

When the 6 dot/mm emulation is selected, logos and graphics are expanded horizontally and vertically to emulate their size on a 6 dot/mm printer. The horizontal positioning commands also emulate positioning on a 6 dot/mm printer.

**Exception:**

This command is available in A758 Native Mode only.

# Status Commands

## Status Command Introduction

The A758 has three methods of providing status to the application. These methods are through Batch Status Commands, Real Time Status Commands, and Auto Status Back. An application may use one or more of these methods to understand the current status of the printer. A brief description of each of these methods follows.

**Batch Status Commands** – These commands are sent to the printer and stored in the printer's buffer. Once the printer has processed all the previous commands these commands are processed and the proper status is returned to the application. In the event a condition causes the printer to go BUSY, it stops processing commands from the printer buffer. If a Batch Status Command remained in the buffer during this busy condition, it would not be processed. In fact, no Batch Commands are processed while the printer is in this state.

**Real-Time Commands** – These commands are sent to the printer and are NOT stored in the printer's buffer. Instead, they are acted on immediately (regardless of the printer's BUSY status) and their response (if any) is returned to the application. This gives the application the ability to query the printer when it is in a busy state in order to correct whatever fault has occurred.

**Auto Status Back** – This mechanism allows the application developer to program the printer to automatically respond with a four byte status when certain conditions in the printer change.

Please see the subsequent sections for a more detailed description of these status commands. At the end of this Status Commands section is a page entitled "Recognizing Data from the Printer". This describes how to interpret what command or setting (in the case of Auto Status Back) triggered a response from the printer.

## Batch Mode

For RS-232C printers, these commands enable the printer to communicate with the host computer following the selected handshaking protocol, either DTR/DSR or XON/XOFF. They are stored in the printer's data buffer as they are received, and are handled by the firmware in the order in which they are received.

When a fault occurs, the printer will go busy at the RS-232C interface and not respond to any of the Batch Mode Printer Status commands. If the fault causing the busy condition can be cleared, such as by loading paper, or letting the thermal printhead cool down, the printer will resume processing the data in its receive buffer.

### Transmit Peripheral Device Status

**ASCII**:        ESC u 0
**Hexadecimal**:  1B 75 0
**Decimal:**      27 117 0

|                  | Bit 0               | Bit 1               |
|------------------|---------------------|---------------------|
| **Return Value:**| 1 = Drawer 1 closed | 1 = Drawer 2 closed |
|                  | 0 = Drawer 1 open   | 0 = Drawer 2 open   |

(Bits 2-7 are not used)

Transmits current status of the cash drawers. One byte is sent to the host computer. In DTR/DSR protocol the printer waits for DSR = SPACE. If a drawer is not connected, the status will indicate it is closed.

### Request Alternate Status (Parallel Only)

**ASCII**:        ESC u $n$
**Hexadecimal**:  1B 75 $n$
**Decimal:**      27 117 $n$

**Value and Range of $n$:**

| Value of $n$ | Function | Description |
|---|---|---|
| 00 | Drawer 1 | High = Open<br>Low = Closed or Not Present |
| 01 | Drawer 2 | High = Open<br>Low = Closed or Not Present |
| 02 | Paper Low (Not Implemented. Interpreted as Paper Out.) | High = Paper Out<br>Low = Paper Present |
| 03 | Paper Out (Default) | High = Paper Out<br>Low = Paper Present |
| >03 | Ignored, No Change | Printer Does Not Stay BUSY[1] |

[1]PAPER EXHAUST LINE is valid to indicate previously requested status.

This command allows the printer to inform the host when the data in the buffer has been processed, when the IEEE 1284 interface is in unidirectional mode. When this command is sent to the printer, the printer goes "Busy" until all data which has been sent to the printer has been processed. The PAPER EXHAUST line shows the status for the cash drawer or receipt paper as shown in the table.

Status information is limited to what can be sent by the dedicated lines: BUSY, ACK, PAPER EXHAUST, and FAULT.

**Transmit Printer Status**

**ASCII**:          ESC v
**Hexadecimal**:    1B 76
**Decimal:**        27 118

Sends status data to the host computer. The printer sends one byte to the host computer when it is not busy or in a fault condition. In DTR/DSR protocol, the printer waits for DSR = SPACE.

**Status Byte (RS-232C)**

| Bit | Function | 0 Signifies | 1 Signifies |
|---|---|---|---|
| 0 | Receipt Paper | Ok | Low |
| 1 | Receipt Cover or Front Cover | Closed | Open |
| 2 | Receipt Paper | Ok | Out |
| 3 | Knife or Slip | Ok | Jam |
| 4 | Always Zero | | |
| 5 | Slip Leading Edge Sensor | Not Covered | Covered |
| 6 | Slip Trailing Edge Sensor | Not Covered | Covered |
| 7 | Thermal Head Temp or voltage | Ok | Out of Range |

**Related Information:**

See Real Time Commands, in this document for details about fault condition reporting.

**Transmit Printer ID**

| | |
|---|---|
| **ASCII** | GS I *n* |
| **Hexadecimal** | 1D 49 *n* |
| **Decimal** | 29 73 *n* |

| | |
|---|---|
| **Value of *n*** | 1, 49 = Printer model ID |
| | 2, 50 = Type ID |
| | 3, 51 = ROM version ID |

**Transmits the printer ID specified by *n* as follows:**

| N | Printer ID | Specification | ID (hexadecimal) |
|---|---|---|---|
| 1, 49 | Printer model ID | Axiohm A758 | 0x28 (A758 Native Mode) |
| 1, 49 | Printer model ID | Axiohm A756 | 0x26 (A756 Emulation) |
| 2, 50 | Type ID | Installed options | Refer to the table below |
| 3, 51 | ROM version ID | ROM version | 0x00 |
| 4, 52 | Logo Definition | Logo Definition | Refer to table below |

**Type ID (n=2)**

| Bit | Off/On | Hex | Decimal | Function |
|---|---|---|---|---|
| 0 | Off | 00 | 0 | No two-byte character code installed. |
| | On | 01 | 1 | Two-byte character code installed. |
| 1 | Off | 00 | 0 | No knife installed. |
| | On | 02 | 2 | Knife installed. |
| 2 | - | - | - | Undefined |
| 3 | Off | 00 | 0 | No MICR installed. |
| | On | 08 | 8 | MICR installed. |
| 4 | Off | 00 | 0 | Not used. Fixed to Off. |
| 5 | - | - | - | Undefined |
| 6 | - | - | - | Undefined |
| 7 | Off | 00 | 0 | Not used. Fixed to Off. |

**Type ID (n=4)**

| Bit | Off/On | Hex | Decimal | Function |
|---|---|---|---|---|
| 0 | Off | 00 | 0 | No logo definition loaded by application. |
| | On | 01 | 1 | Logo loaded by application. |
| 1 | - | - | - | Undefined |
| 2 | - | - | - | Undefined |
| 3 | - | - | - | Undefined |
| 4 | Off | 00 | 0 | Not used. Fixed to Off. |
| 5 | - | - | - | Undefined |
| 6 | - | - | - | Undefined |
| 7 | Off | 00 | 0 | Not used. Fixed to Off. |

**Transmit Printer ID, Remote Diagnostics Extension**

**ASCII**:            GS I @ *n*
**Hexadecimal**:   1D 49 40 *n*
**Decimal:**        29 73 64 *n*

**Values of *n*:**   Refer to table

**Range of *n*:**    32 – 255
                 (not all defined but reserved)

Performs the remote diagnostic function specified by *n*.

Eighteen remote diagnostic items are defined: eight printer ID items and ten printer tally items. A group of four remote diagnostic functions is assigned to each diagnostic item. Most of the diagnostic items are maintained in non-volatile memory (NVRAM), but some are maintained in read-only memory (ROM).

The table that follows describes the variables.

The first item group in the table includes an example of data to send and to receive. Data sent from the host to write to NVRAM must contain all digits required by the remote diagnostic item. All data must be ASCII. The printer returns all ASCII data. It is preceded by the parameter *n* to identify the diagnostic item and is followed by a Carriage Return (0D) to signify the end of the data.

The command performs the remote diagnostic function specified by *n* as described in the following table.

| Value of *n* ASC | Hex | Dec | Remote Diagnostic Item | Function |
|---|---|---|---|---|
| Space | 20 | 32 | Serial #, 10 digit ASCII | Write to NVRAM<br>Example, send 14 bytes to printer: GS I @ 0x20 1234567890 |
| ! | 21 | 33 | Serial # | Write to NVRAM, and print on receipt to verify<br>Example, send 14 bytes to printer: GS I @ ! 1234567890<br>This will print on receipt: Serial # written: 1234567890 |
| " | 22 | 34 | Serial # | Not available, cannot clear Serial # item |
| # | 23 | 35 | Serial # | Return Serial #, preceded by *n* to identify<br>Printer returns 12 bytes in above example: #1234567890<CR> |
| $ | 24 | 36 | Class/model #, 15 digit ASCII | Write to NVRAM |
| % | 25 | 37 | Class/model # | Write to NVRAM, and print on receipt to verify |
| ' | 27 | 39 | Class/model # | Return Class/model #, returns 17 bytes |
| + | 2B | 43 | Boot firmware part #, 12 digit ASCII | Return Boot firmware part #, returns 14 bytes |
| / | 2F | 47 | Boot firmware CRC, 4 digit ASCII | Return Boot firmware CRC, returns 6 bytes |
| 3 | 33 | 51 | Flash firmware part #, 12 digit ASCII | Return Flash firmware part #, returns 14 bytes |
| 7 | 37 | 55 | Flash firmware CRC, 4 digit ASCII | Return Flash firmware CRC, returns 6 bytes |

| Value of *n* | | | Remote Diagnostic Item | Function |
|---|---|---|---|---|
| ASC | Hex | Dec | | |
| Ç | 80 | 128 | Receipt lines tally, 8 digit ASCII numeric, max 99,999,999 | Write to NVRAM<br>Example, send 12 bytes to printer: GS  I  @  Ç00010000<br>To set receipt lines tally to 10,000 |
| ü | 81 | 129 | Receipt lines tally | Write to NVRAM, and print on receipt to verify<br>Example, send 12 bytes to printer: GS  I  @  ü00010000<br>This will print on receipt: Receipt tally written:  10,000 |
| é | 82 | 130 | Receipt lines tally | Clear receipt lines tally to 0 |
| â | 83 | 131 | Receipt lines tally | Return receipt lines tally, preceded by *n* to identify<br>Printer returns 10 bytes in above example: â00010000<CR> |
| ä | 84 | 132 | Knife cut tally, 8 digit ASCII numeric, max 99,999,999 | Write to NVRAM |
| à | 85 | 133 | Knife cut tally | Write to NVRAM, and print on receipt to verify |
| å | 86 | 134 | Knife cut tally | Clear knife cut tally to 0 |
| ç | 87 | 135 | Knife cut tally | Return knife cut tally, returns 10 bytes |
| ê | 88 | 136 | Slip character tally, 8 digit ASCII numeric, max 99,999,999 | Write to NVRAM |
| ë | 89 | 137 | Slip character tally | Write to NVRAM, and print on receipt to verify |
| è | 8A | 138 | Slip character tally | Clear slip character tally to 0 |
| ï | 8B | 139 | Slip character tally | Return slip character tally, returns 10 bytes |
| î | 8C | 140 | MICR read tally, 8 digit ASCII numeric, max 99,999,999 | Write to NVRAM |
| ì | 8D | 141 | MICR read tally | Write to NVRAM, and print on receipt to verify |
| Ä | 8E | 142 | MICR read tally | Clear MICR read tally to 0 |
| Å | 8F | 143 | MICR read tally | Return MICR read tally, returns 10 bytes |
| É | 90 | 144 | Hours on tally, 8 digit ASCII numeric, max 99,999,999 | Write to NVRAM |
| æ | 91 | 145 | Hours on tally | Write to NVRAM, and print on receipt to verify |
| Æ | 92 | 146 | Hours on tally | Clear Hours on tally to 0 |
| ô | 93 | 147 | Hours on tally | Return Hours on tally, returns 10 bytes |
| ù | 97 | 151 | Boot firmware version | Return Boot firmware version, returns 6 bytes |
| ú | A3 | 163 | Flash firmware version | Return Flash firmware version, returns 6 bytes |
| ñ | A4 | 164 | Flash cycles tally, 8 digit ASCII numeric, max 99,999,999 | Write to NVRAM |

| Value of *n* | | | Remote Diagnostic Item | Function |
| ASC | Hex | Dec | | |
|---|---|---|---|---|
| Ñ | A5 | 165 | Flash cycles tally | Write to NVRAM, and print on receipt to verify |
| a | A6 | 166 | Flash cycles tally | Clear Flash cycles cut tally to 0 |
| o | A7 | 167 | Flash cycles tally | Return Flash cycles cut tally, returns 10 bytes |
| ¿ | A8 | 168 | Knife jams tally, 8 digit ASCII numeric, max 99,999,999 | Write to NVRAM |
| ⌐ | A9 | 169 | Knife jams tally | Write to NVRAM, and print on receipt to verify |
| ¬ | AA | 170 | Knife jams tally | Clear Knife jams tally to 0 |
| ½ | AB | 171 | Knife jams tally | Return Knife jams tally, returns 10 bytes |
| ¼ | AC | 172 | Cover openings tally, 8 digit ASCII numeric, max 99,999,999 | Write to NVRAM |
| ¡ | AD | 173 | Cover openings tally | Write to NVRAM, and print on receipt to verify |
| « | AE | 174 | Cover openings tally | Clear Cover openings tally to 0 |
| » | AF | 175 | Cover openings tally | Return Cover openings tally, returns 10 bytes |
| █ | B2 | 178 | Max Temperature tally | Set Max temp tally to -273 |
| │ | B3 | 179 | Max Temperature tally | Return Max Temperature tally, returns 10 bytes |
| ┤ | B4 | 180 | Slip lines tally, 8 digit ASCII numeric, max 99,999,999 | Write to NVRAM |
| ╡ | B5 | 181 | Slip lines tally | Write to NVRAM, and print on receipt to verify |
| ╢ | B6 | 182 | Slip lines tally | Clear Slip lines tally to 0 |
| ╖ | B7 | 183 | Slip lines tally | Return Slip Lines tally, returns 10 bytes |

**Transmit Status**

**ASCII**:          GS r *n*
**Hexadecimal**:   1D 72 *n*
**Decimal:**       29 114 *n*

**Value of *n*:**   1, 49 = printer status
                   2, 50 = cash drawer status
                   3, 51 = slip paper status
                   4, 52 = Flash Memory status

Transmits the status specified by *n*. This is a batch mode command which transmits the response after all prior data in the receive buffer has been processed. There may be a time lag between the printer receiving this command and transmitting the response, depending on the receive buffer status.

When DTR/DSR RS232C communications handshaking control is selected, the printer transmits the one byte response only when the host signal DSR indicates it is ready to receive data.

When XON/XOFF RS232C communications handshaking control is selected, the printer transmits the one byte response regardless of the host signal DSR.

When Auto Status Back (ASB) is enabled using the Enable/Disable Automatic Status Back command (1D 61), the status transmitted by this command (Transmit Status) and the ASB status must be differentiated according to the information found in Recognizing Data from the Printer. This is found in the Real Time Commands section of this document.

The status bytes to be transmitted are described in the following four tables.

**Printer Status (*n* = 1 or *n* = 49)**

| Bit | Off/On | Hex | Decimal | Status for Transmit Status |
|-----|--------|-----|---------|----------------------------|
| 0   | Off    | 00  | 0       | Receipt paper adequate.    |
|     | On     | 01  | 1       | Receipt paper low.         |
| 1   | Off    | 00  | 0       | Receipt paper adequate.    |
|     | On     | 02  | 2       | Receipt paper low.         |
| 2   | Off    | 00  | 0       | Receipt paper present.     |
|     | On     | 04  | 4       | Receipt paper exhausted.   |
| 3   | Off    | 00  | 0       | Receipt paper present.     |
|     | On     | 08  | 8       | Receipt paper exhausted.   |
| 4   | Off    | 00  | 0       | Not used. Fixed to off.    |
| 5   | Off    | 00  | 0       | Slip leading edge sensor: paper present |
|     | On     | 20  | 32      | Slip leading edge sensor: no paper. |
| 6   | Off    | 00  | 0       | Slip trailing edge sensor: paper present |
|     | On     | 40  | 64      | Slip trailing edge sensor: no paper. |
| 7   | Off    | 00  | 0       | Not used. Fixed to off.    |

**Cash Drawer Status (*n* = 2 or *n* = 50)**

| Bit | Off/On | Hex | Decimal | Status for Transmit Status |
|-----|--------|-----|---------|----------------------------|
| 0 | Off | 00 | 0 | One or both cash drawers open. |
|   | On | 01 | 1 | Both cash drawers closed. |
| 1 | Off | 00 | 0 | One or both cash drawers open. |
|   | On | 02 | 2 | Both cash drawers closed. |
| 2 | - | - | - | Undefined |
| 3 | - | - | - | Undefined |
| 4 | Off | 00 | 0 | Not used. Fixed to off. |
| 5 | - | - | - | Undefined |
| 6 | - | - | - | Undefined |
| 7 | Off | 00 | 0 | Not used. Fixed to off. |

**Slip Paper Status (*n* = 3 or *n* = 51)**

| Value of Byte Returned | Slip Status |
|------------------------|-------------|
| 0 | There is no more printing space on the current slip, or the slip paper is not selected. |
| 1 to 8 | Remaining print area on the current slip, in number of lines, at the currently set line spacing, when the trailing edge sensor has become uncovered. |
|   | Until the trailing edge sensor becomes uncovered the value reported will be 6, because there are at least 6 lines remaining. |
|   | There can be 7 or 8 lines remaining when the slip line spacing has been set to less than 7.2 lines per inch. |

**Flash Memory Status (*n* = 4 or *n* = 52)**

| Bit | Off/On | Hex | Decimal | Status for Transmit Status |
|-----|--------|-----|---------|----------------------------|
| 0 | Off | 00 | 0 | Undefined. Fixed to off. |
| 1 | Off | 00 | 0 | Undefined. Fixed to off. |
| 2 | Off | 00 | 0 | User data storage write successful. |
|   | On | 04 | 4 | User data storage write failed. Specified area not erased. |
| 3 | Off | 00 | 0 | Flash logo area adequate. Definition stored. |
|   | On | 08 | 8 | Flash logo area not adequate for recent definition. |
| 4 | Off | 00 | 0 | Not used. Fixed to off. |
| 5 | Off | 00 | 0 | No thermal user-defined characters written to Flash |
|   | On | 20 | 32 | Thermal user-defined characters written to Flash. |
| 6 | Off | 00 | 0 | No impact user-defined characters written to Flash. |
|   | On | 04 | 64 | Impact user-defined characters written to Flash. |
| 7 | Off | 00 | 0 | Not used. Fixed to off. |

**Range of *n*:**     1 – 4
                      49 - 52

**Exceptions:**

When *n* is out of the specified range, the command is ignored.

**Recognizing Data from the Printer**

An application sending various Real Time and non-Real Time commands to which the printer responds can determine which command a response belongs to by the table below.

Responses to Transmit Peripheral Device Status (1B 75) and Transmit Paper Sensor Status (1B 76) are non-Real Time responses and will arrive in the order in which they were solicited.

| Batch Mode Response | | Response Recognized By: | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ASCII | HEX | | | | | | | | | |
| ESC u 0 | 1B 75 0 | 0 | 0 | 0 | 0 | 0 | 0 | x | x | Binary |
| ESC v | 1B 76 | 0 | 0 | 0 | 0 | 0 | x | x | x | Binary |
| GS I *n* | 1D 49 n | 0 | x | x | 0 | x | x | x | x | Binary |
| GS r *n* | 1D 72 n | 0 | x | x | 0 | x | x | x | x | Binary |

| Real-Time Response | | Response Recognized By: | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ASCII | HEX | | | | | | | | | |
| GS EOT *n* | 1D 04 n | 0 | x | x | 1 | x | x | 1 | 0 | Binary |
| DLE EOT *n* | 10 04 n | 0 | x | x | 1 | x | x | 1 | 0 | Binary |
| GS ENQ | 1D 05 | 1 | x | x | x | x | x | x | x | Binary |
| XON | | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | Binary |
| XOFF | | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | Binary |

| Auto Status Back (ASB) | Response Recognized By: | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ASB Byte 1 | 0 | x | x | 1 | x | x | 0 | 0 | Binary |
| ASB Bytes 2-4 | 0 | x | x | 0 | x | x | x | x | Binary |

## Real Time Commands

These commands provide an application interface to the printer even when the printer is not handling other commands (RS-232C communication interface only):

◆ Real Time Status Transmission (GS Sequence and DLE Sequence)

◆ Real Time Request to Printer (GS Sequence and DLE Sequence)

◆ Real Time Printer Status Transmission

The Batch Mode Printer Status commands are placed in the printer's data buffer as they are received and handled by the firmware in the order in which they are received. If the paper exhausts while printing data that was in the buffer ahead of the status command, the printer goes busy at the RS-232C interface and suspends processing the data in the buffer until paper is reloaded. This is true for all error conditions: knife home error, slip paper jam, thermal printhead overheat, etc.

In addition, there is no way to restart the printer after a paper jam, or to cancel a slip waiting condition when using the Wait for Slip command.

The Real Time commands are implemented in two ways to correct these problems. Both implementations offer the same functionality; which one you choose depends on the current usage of your application.

### Preferred Implementation

For a new application the GS (1D) sequences are recommended to avoid possible misinterpretation of a DLE (0x10) sequence as a Clear Printer (0x10 0, ASCII DLE NUL) command.

An application using these GS (1D) sequences, does not need to distinguish for the printer between the new real time commands and the Clear Printer command. This implementation is ideal for an existing A756 application that already uses the Clear Printer command or for a new application being developed.

### Alternate Implementation

The alternate implementation uses the DLE (0x10) sequences as implemented on other printers. An application using these DLE (0x10) sequences and the original A756 Clear Printer command (0x10) must distinguish for the printer between the new real time commands and the Clear Printer command by adding a NUL (0x00) to the Clear Printer command.

An application using these DLE (0x10) sequences must also send the second byte of the sequence within 100 milliseconds of the first, to prevent the first byte being mistaken for a Clear Printer command.

### Rules for Using Real Time Commands

Three situations must be understood when using real time commands.

First, the printer executes the Real Time command upon receiving it and will transmit status regardless of the condition of the DSR signal.

Second, the printer transmits status whenever it recognizes a Real Time Status Transmission command sequence, even if that sequence happens to occur naturally within the data of another command, such as graphics data.

In this case the sequence will also be handled correctly as the graphics data it is intended to be when the graphics command is executed from the buffer.

Third, care must be taken not to insert a Real Time command into the data sequence of another command that consists of two or more bytes.

In this case the printer will use the real time command sequence bytes instead of the other command's parameter bytes when finally executing that other command from the buffer; the other command will NOT be executed correctly.

These three situations generally preclude use of standard DOS drivers for the serial communication ports when using real time commands.

**Moving Data Through the Buffer**

Another consideration is that an application should take care not to let the buffer fill up with real time commands when the printer is busy at the RS-232C interface. A busy condition at the RS-232C interface can be determined by bit 3 of the response to 1D 05 or 1D 04 1 or 10 04 1. The reason for a particular busy condition can be determined by other responses to 1D 04  n or 10 04 n.

Although the printer responds to Real Time commands when it is busy, it will place them into the buffer behind any other data there, and flush them out in the order in which they were received. When the printer is busy due simply to buffer full (that is, it can't print data as fast as it can receive it), then data continues to be processed out of the buffer at approximately print speed and the Real Time commands will eventually get flushed out.

When the printer is busy due to an error condition, then data stops being processed out of the buffer until the condition clears one way or another. In either case, but more quickly in the case of an error condition, the buffer can fill with real time commands.

When the DLE sequences are being used, the last byte stored when the buffer fills up could be the DLE code, with no room for the subsequent EOT or ENQ. When this lone DLE byte is finally processed out of the buffer it will be interpreted as a Clear Printer command.

Similarly, when the GS sequences are being used, the last byte stored when the buffer fills up could be the GS code, with no room for the subsequent EOT or ETX or ENQ. When this lone GS byte is finally processed out of the buffer it will use the next byte, whatever it is, as the second byte in its GS sequence.

To guard against this situation, an application should determine the cause of a busy condition and take appropriate action or pace further real time commands to avoid filling the buffer. There are a minimum of 256 bytes available in the printer's buffer when it goes busy.

**Real Time Status Transmission**

|                  | GS Sequence | DLE Sequence |
|------------------|-------------|--------------|
| **ASCII**:       | GS EOT *n*  | DLE EOT *n*  |
| **Hexadecimal**: | 1D 04 *n*   | 10 04 *n*    |
| **Decimal:**     | 29 4 *n*    | 16 4 *n*     |

**Value of *n*:**   GS/DLE Sequence

1 = Transmit printer status
2 = Transmit RS-232C busy status
3 = Transmit error status
4 = Transmit receipt paper status
5 = Slip paper status

Transmits the selected one byte printer status specified by *n* in Real Time according to the following parameters. This command includes two sequences: GS and DLE.

**Exceptions:**

The command is ignored if *n* is out of range.

An application using the DLE sequence must send EOT within 100 milliseconds of DLE or the printer will misinterpret the DLE and execute a Clear Printer command. Avoid this possibility by using the 1D 04 *n* sequence, which is handled exactly the same as 10 04 *n*.

**Related Information:**

**1 = Transmit Printer Status**

| Bit | Status | Hex | Decimal | Function |
|-----|--------|-----|---------|----------|
| 0   | Off    | 00  | 0       | Fixed to Off |
| 1   | On     | 02  | 2       | Fixed to On |
| 2   | Off    | 00  | 0       | One or both cash drawers open |
|     | On     | 04  | 4       | Both cash drawers closed |
| 3   | Off    | 00  | 0       | Not busy at the RS-232C interface |
|     | On     | 08  | 8       | Printer is Busy at the RS-232C interface |
| 4   | On     | 10  | 16      | Fixed to On |
| 5   |        |     |         | Undefined |
| 6   |        |     |         | Undefined |
| 7   | Off    | 00  | 0       | Fixed to Off |

(Real Time Status Transmission—continued on the next page)

**2 = Transmit RS-232C Busy Status**

| Bit | Status | Hex | Decimal | Function |
| --- | --- | --- | --- | --- |
| 0 | Off | 00 | 0 | Fixed to Off |
| 1 | On | 02 | 2 | Fixed to On |
| 2 | Off | 00 | 0 | Both receipt and cassette doors closed |
|   | On | 04 | 4 | Receipt or cassette door open |
| 3 | Off | 00 | 0 | Paper Feed Button is not pressed |
|   | On | 08 | 8 | Paper Feed Button is pressed |
| 4 | On | 10 | 16 | Fixed to On |
| 5 | Off | 00 | 0 | Printing not stopped due to paper condition |
|   | On | 20 | 32 | Printing stopped due to paper condition |
| 6 | Off | 00 | 0 | No error condition |
|   | On | 40 | 64 | Error condition exists in the printer |
| 7 | Off | 00 | 0 | Fixed to Off |

**3 = Transmit Error Status**

| Bit | Status | Hex | Decimal | Function |
| --- | --- | --- | --- | --- |
| 0 | Off | 00 | 0 | Fixed to Off |
| 1 | On | 02 | 2 | Fixed to On |
| 2 | Off | 00 | 0 | No slip motor or flip jam |
|   | On | 04 | 4 | Slip motor or flip jam occurred |
| 3 | Off | 00 | 0 | No knife error |
|   | On | 08 | 8 | Knife error occurred |
| 4 | On | 10 | 16 | Fixed to On |
| 5 | Off | 00 | 0 | No unrecoverable error |
|   | On | 20 | 32 | Unrecoverable error occurred |
| 6 | Off | 00 | 0 | Thermal printhead temp./power supply voltage are in range |
|   | On | 40 | 64 | Thermal printhead temp./power supply voltage are out of range |
| 7 | Off | 00 | 0 | Fixed to Off |

(Real Time Status Transmission—continued on the next page)

**4 = Transmit Receipt Paper Status**

| Bit | Status | Hex | Decimal | Function |
|-----|--------|-----|---------|----------|
| 0 | Off | 00 | 0 | Fixed to Off |
| 1 | On | 02 | 2 | Fixed to On |
| 2 | Off | 00 | 0 | Receipt paper adequate |
|   | On | 04 | 4 | Receipt paper low |
| 3 | Off | 00 | 0 | Receipt paper adequate |
|   | On | 08 | 8 | Receipt paper low |
| 4 | On | 10 | 16 | Fixed to On |
| 5 | Off | 00 | 0 | Receipt paper present |
|   | On | 20 | 32 | Receipt paper exhausted |
| 6 | Off | 00 | 0 | Receipt paper present |
|   | On | 40 | 64 | Receipt paper exhausted |
| 7 | Off | 00 | 0 | Fixed to Off |

**5 = Transmit Slip Paper Status**

| Bit | Status | Hex | Decimal | Function |
|-----|--------|-----|---------|----------|
| 0 | Off | 00 | 0 | Fixed to Off |
| 1 | On | 02 | 2 | Fixed to On |
| 2 | Off | 00 | 0 | Slip paper selected |
|   | On | 04 | 4 | Receipt paper selected |
| 3 | Off | 00 | 0 | Not waiting for slip |
|   | On | 08 | 8 | Waiting for slip |
| 4 | On | 10 | 16 | Fixed to On |
| 5 | Off | 00 | 0 | Slip leading edge sensor: paper preset |
|   | On | 20 | 32 | Slip leading edge sensor: no paper |
| 6 | Off | 00 | 0 | Slip trailing edge sensor: paper preset |
|   | On | 40 | 64 | Slip trailing edge sensor: no paper |
| 7 | Off | 00 | 0 | Fixed to Off |

**Real Time Request to Printer**

|  | GS Sequence |  | DLE Sequence |
|---|---|---|---|
| **ASCII**: | GS ETX $n$ | or | DLE ENQ $n$ |
| **Hexadecimal**: | 1D 03 $n$ | or | 10 05 $n$ |
| **Decimal:** | 29 3 $n$ | or | 16 5 $n$ |

**Value of $n$:**   1 = Recover and restart
2 = Recover and clear buffers
3 = Cancel slip waiting

The printer responds to a request from the host specified by $n$. This command includes two sequences: GS and DLE. The operations performed depend on the value of $n$, according to the following parameters.

$n = 1$:

Restarts printing from the beginning of the line where an error occurred, after recovering from the error. Print settings that are normally preserved from line to line, such as character height and width, are still preserved with this command. This sequence is ignored except when the printer is busy due to an error condition.

If the receipt is selected, this command will attempt recovery from a knife error. Other errors associated with the receipt, such as paper out or printhead overheating, can be recovered from only by clearing the specific condition, such as loading paper or letting the printhead cool down.

If the slip is selected, this command will attempt recovery from a slip motor or flip jam by re-homing the printhead and waiting for a slip to be inserted before restarting the print. Other errors associated with the slip, such as cassette door open, can be recovered from only by clearing the specific condition, such as closing the cassette door.

$n = 2$:

Recovers from an error after clearing the receive and print buffers. Print settings that are normally preserved from line to line, such as character height and width, are still preserved with this command. This sequence is ignored except when the printer is busy due to an error condition.

If the slip was selected when the error occurred, the receipt becomes selected when the buffers are cleared. When printing on the slip is to continue, the slip must be selected again.

The same error recovery possibilities exist as for $n = 1$.

$n = 3$:

Cancels the slip waiting status. This sequence is ignored except when the printer is waiting for a slip to be inserted.

When slip waiting is canceled, the receive and print buffers are cleared and the receipt is selected. When printing on the slip is to continue, the slip must be selected again.

(Real Time Request to Printer—continued on the next page)

**Exceptions:**

The command is ignored if *n* is out of range

An application using the DLE sequence must send ENQ within 100 milliseconds of DLE or the printer will misinterpret the DLE and execute a Clear Printer command. Avoid this possibility by using the 1D 03 n sequence that is handled exactly the same as 10 05 n.

**Real Time Printer Status Transmission**

**ASCII**:        GS ENQ
**Hexadecimal**: 1D 05
**Decimal:**     29 5

Transmits one byte status of the printer in real time.

**Value of Byte:**

| Bit | Status | Hex | Decimal | Function |
|-----|--------|-----|---------|----------|
| 0 | Off | 00 | 0 | Receipt paper adequate |
|   | On | 01 | 1 | Receipt paper low |
| 1 | Off | 00 | 0 | Receipt paper adequate |
|   | On | 02 | 2 | Receipt paper low |
| 2 | Off | 00 | 0 | Both receipt and cassette doors closed |
|   | On | 04 | 4 | Receipt or cassette door open |
| 3 | Off | 00 | 0 | Not busy at the RS-232C interface |
|   | On | 08 | 8 | Printer is busy at the RS-232C interface |
| 4 | Off | 00 | 0 | One or both cash drawers open |
|   | On | 1 | 16 | Both cash drawers closed |
| 5 | Off | 00 | 0 | Paper present at both slip sensors |
|   | On | 20 | 32 | Paper not present at one or both slip sensors |
| 6 | Off | 00 | 0 | No error condition |
|   | On | 40 | 64 | Error condition exists in the printer |
| 7 | On | 80 | 128 | Fixed to On |

## Auto Status Back

### Select or Cancel Automatic Status Back

**ASCII**:   GS a $n$
**Hexadecimal**: 1D 61 $n$
**Decimal:**   29 97 $n$

**Value of $n$:**  Status of ASB

Enables or disables automatic status back (ASB) and specifies the status items. This command is a batch mode command; that is, it is processed after all prior data in the receive buffer has been processed. There may be a time lag between the printer receiving this command and changing the ASB response, depending on the receive buffer status.

If any of the status items listed are selected, ASB is enabled and the printer automatically transmits 4 status bytes whenever the selected status changes. If no status is selected, ASB is disabled. All four status bytes are transmitted without checking DSR.

If the error status is enabled, a change in the following conditions will trigger the ASB:

♦ Cash Drawer

♦ Receipt Cover

♦ Knife Error

♦ Out-of-Range Printhead Temperature

♦ Out-of-Range Voltage

♦ Paper Exhaust Status

♦ Slip Paper

The bits of $n$ are defined in the table.

| Bit | Off/On | Hex | Decimal | Status for ASB |
|-----|--------|-----|---------|----------------|
| 0 | Off | 00 | 0 | Cash drawer status disabled. |
|   | On | 01 | 1 | Cash drawer status enabled. |
| 1 | Off | 00 | 0 | RS-232C Busy status disabled. |
|   | On | 02 | 2 | RS-232C Busy status enabled. |
| 2 | Off | 00 | 0 | Error status disabled. |
|   | On | 04 | 4 | Error status enabled. |
| 3 | Off | 00 | 0 | Receipt paper roll status disabled. |
|   | On | 08 | 8 | Receipt paper roll status enabled. |
| 4 | - | - | - | Undefined |
| 5 | Off | 00 | 0 | Slip detector, slip paper status disabled. |
|   | On | 20 | 32 | Slip detector, slip paper status enabled. |
| 6 | - | - | - | Undefined |
| 7 | - | - | - | Undefined |

**Default:**  0 (ASB disabled)

(Select or Cancel Status Back—continued on the next page)

**Exceptions**

If *n* = 0, ASB is disabled.

**Related Information**

When Auto Status Back (ASB) is enabled using this command, the status transmitted by other commands and the ASB status are differentiated according to the information found in Recognizing Data from the printer, (in the Real Time Commands section in this chapter). The status bytes to be transmitted are described in the following four tables.

> *Byte 1* =  printer information
> *Byte 2* =  error information
> *Byte 3* =  paper sensor information
> *Byte 4* =  paper sensor information

**First Byte (Printer Information)**

| Bit | Off/On | Hex | Decimal | Status for ASB |
|-----|--------|-----|---------|----------------|
| 0 | Off | 00 | 0 | Not used. Fixed to off. |
| 1 | Off | 00 | 0 | Not used. Fixed to off. |
| 2 | Off | 00 | 0 | One or both cash drawers open. |
|   | On | 04 | 4 | Both cash drawers closed. |
| 3 | Off | 00 | 0 | Not Busy at the RS232C interface. |
|   | On | 08 | 8 | Printer is Busy at the RS232C interface. |
| 4 | On | 10 | 16 | Not used. Fixed to on. |
| 5 | Off | 00 | 0 | Receipt cover closed. |
|   | On | 20 | 32 | Receipt cover open. |
| 6 | Off | 00 | 0 | Paper Feed Button is not pressed. |
|   | On | 40 | 64 | Paper Feed Button is pressed. |
| 7 | Off | 00 | 0 | Not used. Fixed to off. |

**Second Byte (Error information)**

| Bit | Off/On | Hex | Decimal | Status for ASB |
|-----|--------|-----|---------|----------------|
| 0 | - | - | - | Undefined |
| 1 | - | - | - | Undefined |
| 2 | Off | 00 | 0 | No Mechanical Error |
|   | On | 04 | 4 | Mechanical Error Occurred |
| 3 | Off | 00 | 0 | No knife error. |
|   | On | 08 | 8 | Knife error occurred. |
| 4 | Off | 00 | 0 | Not used. Fixed to off. |
| 5 | Off | 00 | 0 | No unrecoverable error. |
|   | On | 20 | 32 | Unrecoverable error occurred. |
| 6 | Off | 00 | 0 | No recoverable error occurred |
|   | On | 40 | 64 | Recoverable error occurred: |
|   |    |    |    | Receipt cover open |
|   |    |    |    | Cassette cover open |
|   |    |    |    | Receipt paper exhausted |
|   |    |    |    | Thermal printhead temp out of range. |
|   |    |    |    | Power supply voltage out of range. |
| 7 | Off | 00 | 0 | Not used. Fixed to off. |

**Third Byte (Paper Sensor Information)**

| Bit | Off/On | Hex | Decimal | Status for ASB |
|-----|--------|-----|---------|----------------|
| 0 | Off | 00 | 0 | Receipt paper adequate |
|   | On | 01 | 1 | Receipt paper low |
| 1 | Off | 00 | 0 | Receipt paper adequate |
|   | On | 02 | 2 | Receipt paper low |
| 2 | Off | 00 | 0 | Receipt paper present. |
|   | On | 04 | 4 | Receipt paper exhausted. |
| 3 | Off | 00 | 0 | Receipt paper present |
|   | On | 08 | 8 | Receipt paper exhausted |
| 4 | Off | 00 | 0 | Not used. Fixed to off. |
| 5 | Off | 00 | 0 | Slip leading edge sensor: paper present |
|   | On | 20 | 32 | Slip leading edge sensor: no paper |
| 6 | Off | 00 | 0 | Slip trailing edge sensor: paper preset |
|   | On | 40 | 64 | Slip trailing edge sensor: no paper. |
| 7 | Off | 00 | 0 | Not used. Fixed to off. |

**Fourth Byte (Paper Sensor Information)**

| Bit | Off/On | Hex | Decimal | Status for ASB |
|---|---|---|---|---|
| 0 | Off | 00 | 0 | Slip paper selected |
|   | On | 01 | 1 | Receipt paper selected |
| 1 | Off | 00 | 0 | Possible to print in slip |
|   | On | 02 | 2 | Not possible to print on slip because no form has been inserted |
| 2 | - | - | - | Undefined |
| 3 | - | - | - | Undefined |
| 4 | Off | 00 | 0 | Not used. Fixed to off. |
| 5 | - | - | - | Undefined |
| 6 | - | - | - | Undefined |
| 7 | Off | 00 | 0 | Not used. Fixed to off. |

## Bar Code Commands

These commands format and print bar codes and are described in order of their hexadecimal codes.

**Note:** A756 firmware can be set for module widths in bar codes ranging from 2 dots to 4 dots per module (DPM) for the narrow modules. The default is 3 DPM. A758 firmware ranges from 1 dot per module to 5 dots per module (DPM) printed on the receipt. The default is 2 DPM.

### Select Printing Position for HRI Characters

**ASCII**:        GS H *n*
**Hexadecimal**:  1D 48 *n*
**Decimal:**      29 72 *n*

**Value of *n*:**    Printing position

                  0 = Not printed
                  1 = Above the bar code
                  2 = Below the bar code
                  3 = Both above and below the bar code

**Default:**       0 (Not printed)

Prints HRI (Human Readable Interface) characters above or below the bar code.

### Select Pitch for HRI Characters

**ASCII**:        GS f *n*
**Hexadecimal**:  1D 66 *n*
**Decimal:**      29 102 *n*

**Value of *n*:**    Pitch
                  0 = Standard Pitch at 15.2 CPI on receipt
                  1 = Compressed Pitch at 19 CPI on receipt

**Default:**       0 (Standard Pitch at 15.2 CPI)

Selects standard or compressed font for printing Bar Code characters.

When slip is selected as the interface, HRI is always compressed.

### Select Bar Code Height

**ASCII**:        GS h *n*
**Hexadecimal**:  1D 68 *n*
**Decimal:**      29 104 *n*

**Value of *n*:**    Number of dots

**Range of *n*:**    1 - 255

**Default:**       162

Sets the bar code height to *n* dots or $n/8$ mm ($n/203$ inch) for receipt or $n/8.5$ mm ($n/216$ inch) for slip.

### Print Bar Code

|                  | First Variation              | Second Variation        |
|------------------|------------------------------|-------------------------|
| **ASCII**:       | GS k *m d1…dk* NUL        or  | GS k *m n d1…dn*         |
| **Hexadecimal**: | 1D 6B *m d1…dk* 00        or  | 1D 6B *m n d1…dn*       |
| **Decimal:**     | 29 107 *m d1…dk* 0        or  | 29 107 *m n d1…dn*      |

0 = End of command.

**Values:**

First Variation: String terminated with NUL Character

$m = 0 – 6, 10$
$d = 32 - 126$ (see the table)
$n = 1 - 255$ (see the table)

Selects the bar code type and prints a bar code for the ASCII characters entered. If the width of the bar code exceeds one line, the barcode is not printed.

There are two variations to this command. The first variation uses a NUL character to terminate the string; the second uses a length byte at the beginning of the string to compensate for the Code 128 bar code, which can accept a NUL character as part of the data. With the second variation the length of byte is specified at the beginning of the string.

Fixed-length codes can be aligned left, center, or right using the Align Positions command (1B 61). Variable-length codes are always center aligned in A756 Emulation.

The check digit is calculated for UPC and JAN (EAN) codes if it is not sent from the host computer. Six-character zero-suppressed UPC-E tags are generated from full 11 or 12 characters sent from the host computer according to standard UPC-E rules. Start/Stop characters are added for Code 39 if they are not included.

| m  | Bar Code            | d                                                                                                                                                                | n, Length                            |
|----|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| 0  | UPC-A               | 48- 57 (ASCII numerals)                                                                                                                                           | Fixed Length: 11, 12                 |
| 1  | UPC-E               | 48- 57                                                                                                                                                            | Fixed Length: 11, 12                 |
| 2  | JAN13 (EAN)         | 48- 57                                                                                                                                                            | Fixed Length: 12, 13                 |
| 3  | JAN8 (EAN)          | 48- 57                                                                                                                                                            | Fixed Length: 7, 8                   |
| 4  | Code 39             | 48- 57, 65- 90 (ASCII alphabet), 32, 36, 37, 43, 45, 46, 47 (ASCII special characters) *d1 = dk* = 42 (start/stop code is supplied by printer if necessary)      | Variable Length                      |
| 5  | Interleaved 2 of 5  | 48- 57                                                                                                                                                            | Variable Length (Even Number)        |
| 6  | Codabar             | 65- 68, start code 48- 57, 36, 43, 45, 46, 47, 58                                                                                                                 | Variable Length                      |
| 10 | PDF 417             | 1-255                                                                                                                                                             | Variable Length A758 Native Mode     |

(Print Bar Code--continued on the next page)

<u>Second Variation</u>: Length of Byte Specified at Beginning of String

$m$ = 65 - 73, 75 (see the table)
$d$ = 0 - 127 (see the table)
$n$ = 1 - 255 (see the table)

The value of $m$ selects the bar code system as described in the table. When data is present in the print buffer, the printer processes the data following $m$ as normal data.

The variable $d$ indicates the character code to be encoded into the specified bar code system. See the table. If character code $d$ cannot be encoded, the printer prints the bar code data processed so far, and the following data is treated as normal data.

| m | Bar Code | d | n, Length |
|---|---|---|---|
| 65 | UPC-A | 48- 57 (ASCII numerals) | Fixed Length: 11, 12 |
| 66 | UPC-E | 48- 57 | Fixed Length: 11, 12 |
| 67 | JAN13 (EAN) | 48- 57 | Fixed Length: 12, 13 |
| 68 | JAN8 (EAN) | 48- 57 | Fixed Length: 7, 8 |
| 69 | CODE 39 | 48- 57, 65- 90 (ASCII alphabet), 32, 36, 37, 43, 45, 46, 47 (ASCII special characters) $d1 = dn = 42$ (start/stop code is supplied by printer if necessary) | Variable |
| 70 | Interleaved 2 of 5 (ITF) | 48- 57 | Variable (Even Number) |
| 71 | CODABAR (NW-7) | 65- 68, start code 48- 57, 36, 43, 45, 46, 47, 58 | Variable |
| 72 | Code 93 | 48- 57, 65- 90 (ASCII alphabet), 32, 36, 37, 43, 45, 46, 47 (ASCII special characters) $d1 = dn = 42$ (start/stop code is supplied by printer if necessary) | Variable (A758 Native Mode only) |
| 73 | Code 128 | 0-105 $d1 = 103-105$ (must be a Start code) $d2 = 0-102$ (data bytes) (Stop code is provided by the printer) | Variable |
| 75 | PDF417 | 0 – 255 | Variable Length (A758 Native Mode only) |

**Exceptions:**

Illegal data cancels this command.

The command is valid only at the beginning of a line.

PDF 417 format cannot be printed on the slip.

Barcodes on the Slip are always right justified.

PDF417 and Code 93 are only available in A758 Native Mode.

### Select Bar Code Width

**ASCII**:        GS w *n*
**Hexadecimal**:  1D 77 *n*
**Decimal:**      29 119 *n*

**Value of *n*:**    1, 2, 3, 4, 5

**Default:**      3 for receipt; 2 for slip

Sets the bar code width to *n* dots.

**Formulas:**

*n* + *1*/8 mm (*n* + *1*/203 inch) for receipt, n + 1/5.7 mm (n + 1/144 inch) for slip.

Slip module sizing: *n* must be even (it is rounded up if odd) and the size of modules is n + 1/5.7 mm (n + 1/144 inch).

# Page Mode Commands

Page Mode is one of two modes, which the A758 printer uses to operate. Standard Mode is typical of how most printers operate by printing data as it is received and feeding paper as the various paper feed commands are received. Page Mode is different in that it processes or prepares the data as a "page" in memory before it prints it. Think of this as a virtual page. The page can be any area within certain parameters that you define. Once the printer receives the (0x0C) command, it prints the page and returns the printer to Standard Mode.

The Select Page Mode command (1B 4C) puts the printer into Page Mode. Any commands that are received are interpreted as Page Mode commands. Several commands react differently when in Standard Mode and Page Mode. The descriptions of these individual commands in this chapter indicate the differences in how they operate in the two modes.

**Limitations**

Page mode is only implemented on the receipt station in A758 Native Mode only.

## Print and Return to Standard Mode

**ASCII**:          FF
**Hexadecimal**:  0C
**Decimal:**      12

The processed data is printed and the printer returns to Standard Mode. The developed data is deleted after being printed. This command has the same code as the Print and Eject Slip command, which is executed when the printer is not in Page Mode.

**Exceptions:**

This command is enabled only in Page Mode.

## Cancel Print Data in Page Mode

**ASCII**:          CAN
**Hexadecimal**:  18
**Decimal:**      24

Deletes all the data to be printed in the "page" area. Any data from the previously selected "page" area that is also part of the current data to be printed is deleted.

This command has the same code as the Open Form command, which is performed when the printer is not in Page Mode.

**Exceptions:**

This command is only used in Page Mode.

## Print Data in Page Mode

**ASCII**:          ESC FF
**Hexadecimal**:  1B 0C
**Decimal:**      27 12

Collectively prints all buffered data in the printing area.

After printing, the printer does not clear the buffered data and sets values for Select Print Direction in Page Mode (1B 54 n) and Set Print Area in Page Mode (1B 57…), and sets the position for buffering character data.

**Exceptions:**

This command enabled only in Page Mode.

## Select Page Mode

**ASCII**:          ESC L
**Hexadecimal**:  1B 4C
**Decimal:**      27 76

Switches from Standard Mode to Page Mode. After printing has been completed either by the Print and Return to Standard Mode (FF) command or Select Standard Mode (1B 53) the printer returns to Standard Mode. The developed data is deleted after being printed.

This command sets the position where data is buffered to the position specified by Select Print Direction in Page Mode (1B 54) within the printing area defined by Set Print Area in Page Mode (1B 57).

This command switches the settings for the following commands (which values can be set independently in Standard Mode and Page Mode) to those for Page Mode.

♦   Set Right-Side Character Spacing (1B 20)

♦   Select 1/6-Inch Line Spacing (1B 32)

♦   Set Line Spacing (1B 33)

It is possible only to set values for the following commands in Page Mode. These commands are not executed.

♦   Select or Cancel 90 Degree Clockwise Rotation (1B 56)

♦   Select Justification (1B 61)

♦   Select or Cancel Upside-Down Printing (1B 7B).

♦   Set Left Margin (1D 4C)

♦   Set Print Area Width (1D 57)

**Exceptions:**

The command is enabled only when input at the beginning of a line.
The command is available only when the receipt is selected by Select Paper (1B 63 30).
The command has no effect if Page Mode has previously been selected.
The Select Paper (1B 63 30) command can not be used in Page Mode.
In A756 Emulation Mode, (1B 4C…) is used for double density graphics.

## Select Standard Mode

**ASCII**:          ESC S
**Hexadecimal**:  1B 53
**Decimal:**       27 83

Switches from Page Mode to Standard Mode. In switching from Page Mode to Standard Mode, data buffered in Page Mode are cleared, the printing area set by Set Print Area in Page Mode (1B 57) is initialized and the print position is set to the beginning of the line.

This command switches the settings for the following commands (the values for these commands can be set independently in Standard Mode and Page Mode) to those for Standard Mode:

♦   Set Right-Side Character Spacing (1B 20)

♦   Select 1/6 Inch Line Spacing (1B 32)

♦   Set Line Spacing (1B 33)

Standard Mode is automatically selected when power is turned on, the printer is reset, or the Initialize Printer command (1B 40) is used.

**Exceptions:**

This command is effective only in Page Mode.

## Select Print Direction in Page Mode

**ASCII**:          ESC T *n*
**Hexadecimal**:    1B 54 *n*
**Decimal:**        27 84 *n*

**Value of *n*:**    Start position

0 = Upper left corner proceeding across page to the right (A)
1 = Lower left corner proceeding up the page (B)
2 = Lower right corner proceeding across page to the left
          (upside down) (C)
3 = Upper right corner proceeding down page (D)

Selects the printing direction and start position in Page Mode. See the illustration.

The command can be sent multiple times so that several different print areas, aligned in different print directions, can be developed in the printer's page buffer before being printed by the Eject Slip command (0C).
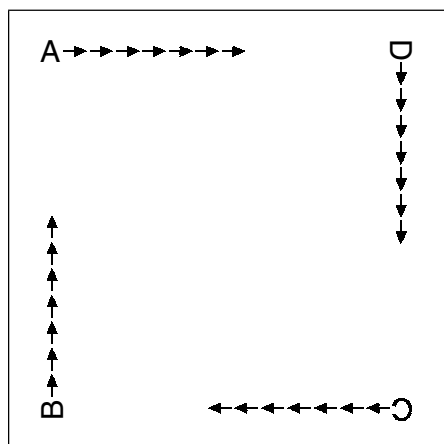


**Default:**        0 (Upper left corner proceeding across page to the right)

**Exceptions:**

This command is valid only in Page Mode.

This command is ignored if the value of *n* is out of the specified range.

### Set Printing Area in Page Mode

**ASCII:**       ESC W *n1, n2 ...n8*.]
**Hexadecimal:** 1B 57 *n1, n2 ...n8]*
**Decimal:**     27 87 *n1,n2 ...n8]*

**Range:**       0 - 255

**Default:**     *n1-4* =  0
                   *n5* =  64
                   *n6* =  2
                   *n7* =  64
                   *n8* =  2

Sets the position and size of the printing area in Page Mode.

The command can be sent multiple times so that several different print areas, aligned in different print directions, can be developed in the printer's page buffer before being printed by the Eject Slip command (0C).

Defaults equal an origin of 0,0 and a size of 576x576. This command is allowed in any mode.

**Formulas:**

The starting position of the print area is the upper left of the area to be printed (x0, y0). The length of the area to be printed in the y direction is set to dy inches. The length of the area to be printed in the x direction is set to dx inches. Use the equations to determine the Value of x0, y0, dx, and dy.

See the illustration for a graphic representation of the printing area. For more information about the fundamental calculation pitch, see the Set Fundamental Calculation Pitch command (1D 50).

♦   x0 = [($n1$ + $n2$ x 256) x (horizontal direction of the fundamental calculation pitch)]

♦   y0 = [($n3$ + $n4$ x 256) x (vertical direction of the fundamental calculation pitch)]

♦   dx = [($n5$ + $n6$ x 256) x (horizontal direction of the fundamental calculation pitch)]

♦   dy = [($n7$ + $n8$ x 256) x (vertical direction of the fundamental calculation pitch)]

Keep the following notes in mind for this command.

♦   The fundamental calculation pitch depends on the vertical or horizontal direction.

♦   The maximum printable area in the x direction is 576/203 inches.

♦   The maximum printable area in the y direction is 2000/203 inches.

**Exception:**

This command is effective only in Page Mode.

**Set Absolute Vertical Print Position in Page Mode**

**ASCII**:          GS $ *nL nH*
**Hexadecimal**:   1D 24 *nL nH*
**Decimal:**        29 36 *nL nH*

**Formulas:**

[(*nL* + *nH* X 256) x (vertical or horizontal motion unit)] inches.

Sets the absolute vertical print starting position for buffer character data in Page Mode.

The vertical or horizontal motion unit for the paper roll is used and the horizontal starting buffer position does not move.

The reference starting position is set by Select Print Direction in Page Mode (1B 54). This sets the absolute position in the vertical direction when the starting position is set to the upper left or lower right; and sets the absolute position in the horizontal direction when the starting position is set to the upper right or lower left. The horizontal and vertical motion unit are specified by the Set Horizontal and Vertical Minimum Motion Units (1D 50) command.

The Set Horizontal and Vertical Minimum Motion Units (1D 50) command can be used to change the horizontal and vertical motion unit. However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the minimum horizontal movement amount.

**Exceptions:**

This command is effective only in Page Mode.

If the [(*nL* + *nH* x 256) x (vertical or horizontal motion unit)] exceeds the specified printing area, this command is ignored.

### Set Relative Vertical Print Position in Page Mode

**ASCII**:         GS \ *nL nH*
**Hexadecimal**:  1D 5C *nL nH*
**Decimal:**      29 92 *nL nH*

Sets the relative vertical print starting position from the current position. This command can also change the horizontal and vertical motion unit. The unit of horizontal and vertical motion is specified by this command.

This command functions as follows, depending on the print starting position set by Select Print Direction in Page Mode (1B 54):

1.  When the starting position is set to the upper left or lower left of the printing area, the vertical motion unit (*y*) is used.

2.  When the starting position is set to the upper right or lower left of the printing area, the horizontal motion unit (*x*) is used.

**Value:**

The value for the horizontal and vertical movement cannot be less than the minimum horizontal movement amount, and must be in even units of the minimum horizontal movement amount.

**Formulas:**

The distance from the current position is set to [(*nL* + *nH* x 256) x vertical or horizontal motion unit] inches. The amount of movement is calculated only for the receipt.

When pitch *n* is specified to the movement downward:

*nL* + *nH* x 256 = *n*

When pitch *n* is specified to the movement upward (the negative direction), use the complement of 65536.

When pitch *n* is specified to the movement upward:

*nL* + *nH* x 256 – 65536 – *N*

**Exceptions:**

This command is used only in Page Mode, otherwise it is ignored.

Any setting that exceeds the specified printing area is ignored.

## Macro Commands

These commands are used to select and perform a user-defined sequence of printer operations.

### Start or End Macro Definition

**ASCII**: GS :
**Hexadecimal**: 1D 3A
**Decimal:** 29 58

Starts or ends macro definition. Macro definition begins when this command is received during normal operation and ends when this command is received during macro definition. The macro definition is cleared, during definition of the macro, when the Execute Macro (1D 5E) command is received.

Normal printing occurs while the macro is defined. When the power is turned on the macro is not defined.

The defined contents of the macro are not cleared by the Initialize Printer (1B 40), thus, the Initialize Printer (1B 40) command may be used as part of the macro definition.

If the printer receives a second Select or Cancel Macro Definition (1D 3A) command immediately after previously receiving a Select or Cancel Macro Definition (1D 3A) the printer remains in the macro undefined state.

**Formulas:**

The contents of the macro can be defined up to 2048 bytes.

**Exceptions:**

If the macro definition exceeds 2048 bytes, excess data is not stored.

This command is available in A758 Native Mode only.

### Execute Macro

**ASCII**:           GS ^ *r t m*
**Hexadecimal**:   1D 5E *r t m*
**Decimal:**        29 94 *r t m*

**Value of *r*:**        The number of times to execute the macro.
**Value of *t*:**        The waiting time for executing the macro.

Executes a macro. After waiting for a specified period the LED indicators blink and the printer waits for the Paper Feed Button to be pressed. After the button is pressed, the printer executes the macro once. The printer repeats this operation the number of specified times.

When the macro is executed by pressing the Paper Feed Button ($m = 1$), paper cannot be fed by using the Paper Feed Button.

**Formulas:**

The waiting time is $t$ x 100 msec for every macro execution.

$m$ specifies macro executing mode when the LSB (Least significant bit) $m = 0$

The macro executes $r$ times continuously at the interval specified by $t$ when the LSB (Least significant bit) of $m = 1$.

**Exceptions:**

If this command is received while a macro is being defined, the macro definition is aborted and the definition is cleared.

If the macro is not defined or if $r$ is 0, nothing is executed.

This command is available in A758 Native Mode only.

## MICR Commands

### MICR Reading

These commands control the Magnetic Ink Character Recognition (MICR) check reader, including how it parses the character strings on checks.

The section, MICR Parsing, describes how to create a parsing format and how to create and maintain an Exceptions table.

#### Read MICR Data and Transmit

**ASCII**:          ESC w 1
**Hexadecimal**:  1B 77 01
**Decimal:**       27 119 1

**Default:**       All data returned

Reads and transmits the MICR data and adds a Carriage Return (0x0D). If no parsing format is selected with either of the Define Parsing Format commands (see below), all data will be returned, which is the default.

#### Reread MICR Data

**ASCII**:          ESC w R
**Hexadecimal**:  1B 77 52
**Decimal:**       27 119 82

Resends the previously decoded MICR data to the host.

### MICR Parsing

This section describes MICR parsing in detail and includes several examples of useful parsing variations. It also describes how to create a parsing format and how to create and maintain an exception table.

#### Define Parsing Format, Save in NVRAM

**ASCII**:          ESC w P *d1 d2 … dn 0D*
**Hexadecimal**:  1B 77 50 *d1 d2 … dn 0D*
**Decimal:**       27 119 80 *d1 d2 … dn 0D*

Defines and saves parsing format. See Parsing Parameter String Options in this document. Send with this command the parse data that is to be the default parse string at printer power-up. If no parameters are selected, parsing is not performed.

d1 through dn are the parse string. The string must be CR terminated. If the string has invalid characters in it or is too long, the printer will store a null string, and raw MICR data will be returned.

**Define Parsing Format, Do Not Save Permanently**

**ASCII**:          ESC w p
**Hexadecimal**:   1B 77 70
**Decimal:**        27 119 112

Defines, but does not save parsing format. See Parsing Parameter String Options in this document. Send this command as often as desired to change the previous parse format string. The data sent with 1B 77 50 will be restored at power-up.

**Exceptions:**

If no parameters are selected, parsing is not performed.

**Parsing Parameter String Options**

**Variable Length Fields**

| Variable Length Field Name | Selector | Comments |
|---|---|---|
| Transit Number | T | Full 9 digit routing/transit number |
| Bank Number | B | Digits 4-8 of transit number |
| Check Digit | D | Digit 9 of transit number |
| Account Number | A | |
| Check Serial Number | C | Separate from account number |
| Amount | $ | This field may not be present or readable |

| Variable Length Field Optional Modifiers | Selector | Comments |
|---|---|---|
| Zero fill to length | 0 | ASCII zero preceding maximum length |
| Maximum length | nn | 1- or 2-digit ASCII number |
| Remove space/dash | X | |
| Replace space/dash with 0 | x | |

**Examples of Variable Length Field Format Specifications**

| | |
|---|---|
| Account #, all characters in the field, keep spaces and dashes | A |
| Account #, all characters in the field, replace spaces and dashes | xA |
| Account #, maximum 12 characters, keep spaces and dashes | 12A |
| Account #, always 12 characters zero filled, remove spaces and dashes | 012XA |

**Other Parameters**

| Error Number | E | One Digit Returned | |
|---|---|---|---|
| | | 0 | Read OK |
| | | 1 | Read error:  bad character, empty field invalid length, check digit invalid |

| Status | S | Two Digits Returned | |
|---|---|---|---|
| | | 01 | No MICR data |
| | | 09 | Mexican check |
| | | 08 | Canadian check |
| | | 05 | Error in transit number |
| | | 07 | Error in account number |
| | | 04 | Error in check serial number |
| | | 10 | Business or commercial check |
| | | 11 | Amount field present |
| | | 00 | No error |

| Field Separator | 'x | |
|---|---|---|
| | | Field separator preceded by a single quote, so a field separator of the letter A would be sent as 'A (0x27 0x41). |
| | | If a Carriage Return is specified as a separator (0x27 0x0D), a final Carriage Return must still terminate the parsing parameter string. |

| Country Code | Un | One Digit Returned | |
|---|---|---|---|
| | | n | returned if US check |
| | | nothing | returned if not US check |

| Country Code | Km | One Digit Returned | |
|---|---|---|---|
| | | m | returned if Canadian check |
| | | nothing | returned if not Canadian check |

| Check Type | L | One Digit Returned | |
|---|---|---|---|
| | | 1 | Personal check |
| | | 2 | Business or commercial check |

Ten parameters are more than enough to specify all variable length fields with a field separator each and other status information that may be helpful to an application. More than 10 parameters are not recommended because they use up space in non-volatile memory (NVRAM) available for the exception table.

The parsing parameter string is stored packed in NVRAM starting at word 10, with the total byte length stored in the high order byte of word 10. While most parameters take two bytes of NVRAM, the following parameters take only one byte: B, D, E, S, L. None of the parsing examples in the following section take more than 14 bytes (seven words) of NVRAM.

The exception table starts at word 20. If the parsing parameter string extends into word 20, then the first exception table entry is unavailable.

**Sample Parsing Formats**

The following strings show various sample formats that you can use assuming they meet your parsing format needs. Included with the sample format is a description of the data that is returned to the application.

**ESC w p 18 A <CR>**

♦   Maximum 18 characters in the account number

♦   Final Carriage Return

**ESC w p 18 X A <CR>**

♦   Maximum 18 characters in the account number with spaces and dashes removed

♦   Final Carriage Return

**ESC w p 18 x A <CR>**

♦   Maximum 18 characters in the account number with spaces and dashes replaced with 0

♦   Final Carriage Return

**ESC w p 018 A <CR>**

♦   Always 18 characters in the account number (high order zero-filled if necessary)

♦   Final Carriage Return

**ESC w p 018 X A <CR>**

♦   Always 18 characters in the account number with spaces and dashes removed

♦   Final Carriage Return

**ESC w p 018 x A <CR>**

♦   Always 18 characters in the account number with spaces and dashes replaced with 0

♦   Final Carriage Return

**ESC w p T 18 X A 04C <CR>**

♦   All characters in the transit number

♦   All characters in the account number (up to 18) with spaces and dashes removed

♦   Always four characters in the check number (zero-filled if check number is only three characters long)

♦   Final Carriage Return

**ESC w p K9 X T 18 X A 04C <CR>**

♦ U.S. check: all nine characters in the transit number (because there are no dashes)

♦ Canadian check: dash in transit number removed; "9" inserted at beginning, resulting in a fully numeric nine character transit number

♦ All characters in the account number (up to 18) with spaces and dashes removed

♦ Always four characters in the check number (zero-filled if check number is only three characters long)

♦ Final Carriage Return

**ESC w p T '/ A '/ C '/ S <CR>**

♦ All characters in the transit number

♦ Field separator: /

♦ All characters in the account number

♦ Field separator: /

♦ All characters in the check number

♦ Field separator: /

♦ Two-digit status

♦ Final Carriage Return

**Notes**

All parameters are ASCII characters, i.e. greater than or equal to 0x20, with the exception of a non-ASCII character enclosed in single quotes as a field separator. This applies both to parameter specifications sent from application to printer, and to MICR data returned from printer to application.

Parameters are positional; their order in the parameter string is the order in which the parsed MICR data will be returned. Unrecognized parameters will be ignored, and processing of the parsing parameters will stop. Any data remaining after the unrecognized parameter will be treated as normal input data.

If parameters are not defined (for example, 1B 77 50 <CR> or 1B 77 70 <CR>) parsing is not selected. One status byte followed by all decoded MICR characters will be returned. This is the default parsing format if no other is selected:

| Status | Status Byte Value |
|---|---|
| Good read, data follows | 0x00 |
| Bad read, data follows | 0x01 |
| No check present, no data | 0x02 |
| Paper jam, no data | 0x03 |
| No MICR characters, no data | 0x04 |

| MICR Characters | ASCII | Hexadecimal |
|---|---|---|
| Numerics | 0...9 | 0x30...0x39 |
| Unrecognized Character | ? | 0x3F |
| Space | | 0x20 |
| Amount symbol | & | 0x26 |
| Dash symbol | ' | 0x27 |
| "on us" symbol | ( | 0x28 |
| Transit symbol | ) | 0x29 |

Once a parsing format is specified, the following values are returned:

| MICR Characters | ASCII | Hexadecimal |
|---|---|---|
| Numerics | 0...9 | 0x30...0x39 |
| Space | | 0x20 |
| Dash | - | 0x2D |
| Field separator* | | |
| Country code* | | |

*As specified in the parsing parameter string

**Check Serial Number**

Parsing the Check Serial Number

Most banks print the check serial number in three easily recognizable spots. The printer firmware will look for the number in these spots, using the following ordered algorithm. The examples use letters to represent symbols on the check:

t    Transit symbol
o    "on us" symbol
$    Amount symbol
-    Dash
c    Check serial number
x    Any other number

A number bracketed by "on us" symbols in the auxiliary "on us" field is the check serial number.

                occccccco txxxxxxxxxt xxxxxxxxo

Otherwise, a three or more digit number to the right of the rightmost "on us" symbol, and to the left of the leftmost amount symbol if an amount field is present, is the check serial number.

                txxxxxxxxxt xxxxxxxxo cccc
                txxxxxxxxxt xxxxxxxxo cccc $xxxxxx$

If both of these searches fail to produce the check serial number, extract the whole account number field from between the rightmost transit symbol and the rightmost "on us" symbol. A three, four, or five-digit number to the right of the rightmost transit symbol, separated by a space or a dash from the rest of the account number is the check serial number.

> txxxxxxxxt cccc xxxxxxxxo
> txxxxxxxxt cccc-xxxxxxxxo
> txxxxxxxxt cccc xxxxxxxxo xx

If all of these searches fail to produce the distinct check serial number, and the check serial number field has been specified in the parsing parameter string options, no check serial number will be returned. If it is imbedded within the account number field, it will be returned as part of that variable length field.

**Exceptions**

Some banks print the check serial number in a location that cannot be electronically distinguished without specific exception information, although it can be visually distinguished because it is repeated in the upper right corner of the check. For these cases, the printer can hold up to nine exceptions for specific banks in its non-volatile memory (NVRAM), which is accessed by the read and write NVRAM commands. The specific bank is picked out by its transit number, and the firmware will look in the exception table for a transit number match before looking in the normal check serial number locations.

In this example, without an exception table entry, the firmware would always pick the rightmost four-digit number as the check serial number following rule two above. The bank with the three digit check serial number and the four digit extension after the "on us" symbol would need to be exceptionally recognized:

> txxxxxxxxt ccc-xxxxxxxxxxoxxxx
> txxxxxxxxt xxx-xxxxxxxxxxocccc

In this example, without an exception table entry, the firmware would not be able to pick out the check serial number because it is not separated from the rest of the account number:

> txxxxxxxxt ccccxxxxxxxxxxo

In this example, without an exception table entry, the firmware would not be able to pick out the check serial number correctly, because it is imbedded within the rest of the account number:

> txxxxxxxxt xxx-ccc-xxxxxxxxxo

**Loading the Exception Table**

The exception table begins at word 20 in NVRAM. Each entry takes five words. There is room for eight exceptions with a sumcheck written in the last word. An application can load local exceptions into the printer using the write NVRAM command:

> 0x1B 0x73 n1 n2 k

which writes the two byte word n1:n2 to word k in NVRAM.

**Exception Table Entry Format**

Each exception table entry consists of five words. The first two words contain the first eight characters of the transit number by packing the low order nibble of the numeric transit number characters. For Canadian checks, eliminate the dash and store the eight numerics.

The next three words are used as six individual bytes to tell the firmware how to interpret the MICR characters that fall to the right of the rightmost transit symbol. Each of the six bytes is positional and consists of two parts: character type and number.

The three high order bits of each byte mark the character type. The characters can be marked in three ways: check serial # character, account # character, or "skip this character or symbol."

The five low order bits of each byte contain the number of characters of that type to extract. Most exceptions will not need to use all six bytes; in that case clear the unused bytes to zero.

| Bits within Byte | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| check serial # character string | 0 | 0 | 1 | n | n | n | n | n |
| account # character string | 0 | 1 | 0 | n | n | n | n | n |
| character string to ignore | 1 | 0 | 0 | n | n | n | n | n |

**Example 1**

t123456780t12349876543210o          1234 is the check serial #
                                     9876543210 is the account #

To load the second table entry, which starts at word 25, the transit number 123456780 would be stored in the first two words of its table entry using this string of commands:

>               0x1B 0x73 0x12 0x34 25
>               0x1B 0x73 0x56 0x78 26

After the right transit symbol are immediately the four characters of the check serial #, followed immediately by the ten characters of the account number. These would be bitwise encoded as:

>               0 0 1  0 0 1 0 0   (check #, four characters)
> and           0 1 0  0 1 0 1 0   (account #, 10 characters)

then stored in the other three words of the table entry using:

>               0x1B 0x73 0x24 0x4A 27
>               0x1B 0x73 0x00 0x00 28
>               0x1B 0x73 0x00 0x00 29

**Example 2**

t22137-632t001 6042202o927540   2754 is the check serial #
                                6042202 is the account #

To load the third table entry, which starts at word 30, the transit number 2137-632 would be stored in the first two words of its table entry using this string of commands:

>               0x1B 0x73 0x22 0x13 30
>               0x1B 0x73 0x76 0x32 31

After the right transit symbol are four characters to skip, a seven digit account number, two characters to skip, and finally a four digit check serial #. The final character to skip need not be encoded. These would be bitwise encoded as:

>               1 0 0  0 0 1 0 0   (skip four characters)
>               0 1 0  0 0 1 1 1   (account #, seven characters)
>               1 0 0  0 0 0 1 0   (skip two characters)
>               0 0 1  0 0 1 0 0   (check #, four characters)

then stored in the other three words of the table entry using:

>               0x1B 0x73 0x84 0x47 32
>               0x1B 0x73 0x82 0x24 33
>               0x1B 0x73 0x00 0x00 34.

**Maintaining the Exception Table**

Present contents of the exception table can be examined using the read NVRAM command:

0x1B 0x6A k

which reads and returns word k in NVRAM. When the exception table is full, a new entry can replace an older, less frequently used entry, by merely rewriting the words for that table entry.

# Check Flip Command

### Check Flip Command

**ASCII**:         ESC w F
**Hexadecimal**:   1B 77 46
**Decimal:**       27 119 70

Causes a check on the slip table to be fed into the printer, flipped and left with the trailing edge of the check in the slip feed rollers. Prior to the flip, the check is measured to see that it is of an appropriate size (see Chapter 4: Media and Supplies, Forms Specification) to be flipped. If not, the check is fed back to the user.

**Exception:**

This command is available only in A758 Native Mode.

## User Data Storage Commands

### Write to User Data Storage

**ASCII:**          ESC ' *m a0 a1 a2 d1 ... dm*
**Hexadecimal:**  1B 27 *m a0 a1 a2 d1 ... dm*
**Decimal:**       27 39 *m a0 a1 a2 d1 ... dm*

**Value of *m*:**     0 – 255

Writes *m* bytes of data to the User Data Storage Flash Page at the address specified. The printer waits for *m* bytes of data following the 3-byte address, *addr*.

If any of the memory locations addressed by this command are not currently erased, the command is not executed.

### Read from User Data Storage

**ASCII:**          ESC 4 *m a0 a1 a2*
**Hexadecimal:**  1B 34 *m a0 a1 a2*
**Decimal:**       27 52 *m a0 a1 a2*

**Value of *m*:**     0 – 255

Reads *m* bytes of data from the User Data Storage Flash Page at the address specified.

### Read from Non-Volatile Memory

**ASCII**:          ESC j *k*
**Hexadecimal**:  1B 6A *k*
**Decimal:**       27 106 *k*

**Range of *k*:**     20 – 63 (decimal)

Reads a two-byte word from location *k* in the history EEROM. The printer returns the word at the next available opportunity.

### Write to Non-Volatile Memory (NVRAM)

**ASCII**:          ESC s *n1 n2 k*
**Hexadecimal**:  1B 73 *n1 n2 k*
**Decimal:**       27 115 *n1 n2 k*

**Value of *n1* :**    $1^{st}$ Byte

**Value of *n2* :**    $2^{nd}$ Byte

**Range of *k* :**     20 - 63 (decimal locations)

Writes the two-byte word, *n1 n2*, to location *k* in history EEROM.

### Select Memory Type (SRAM/Flash) Where to Save Logos or User-Defined Fonts

**ASCII**:       GS " *n*
**Hexadecimal**:    1D 22 *n*
**Decimal:**      29 34 *n*

**Value of *n*:**      48 - 51

Specifies whether to load the logos or user-defined characters to Flash Memory or to RAM (volatile memory). The selection remains in effect until it is changed via this command or until the power cycles.

*n* = 48 (ASCII *n* = 0)
Loads active logo to RAM only. This is used to print a special logo but not have it take up Flash Memory. A logo defined following this command is not preserved over a power cycle.

*n* = 49 (ASCII *n* = 1)
Loads active logo to Flash Memory. This is the default condition for logo Flash storage. A logo defined following this command is stored in Flash Memory.

*n* = 50 (ASCII *n* = 2)
Loads user-defined characters to RAM only. This is the default condition for user-defined character storage. Any user-defined characters defined following this command are not preserved over a power cycle.

*n* = 51 (ASCII *n* = 3)
Loads user-defined characters to Flash Memory. An application must use this command to store user-defined characters in Flash Memory. Any user-defined characters defined following this command are stored in Flash Memory. A user-defined character cannot be redefined in Flash Memory. The Flash Memory page must be erased by an application before redefining user-defined characters. For more information, see the Erase User Flash Sector (1D 40 *n*) command.

**Flash Allocation**

**ASCII**:              GS " U *n1 n*
**Hexadecimal**:    1D 22 55 *n1 n2*
**Decimal:**          29 34 85 *n1 n2*

**Default Value of *n1*:**    1    (see below)
**Default Value of *n2*:**    1    (see below)

n1 is the number of 64k sectors used for logos and user-defined characters.
n2 is the number of 64k sectors used for user data storage.

This command sets the allocation of Flash sectors between user data storage and logos/user-defined characters. This allocation is saved in the EEPROM of the printer and is therefore saved across power cycles.

n1 + n2 <= 2 (512K)
n1 + n2 <= 10 (1M)
n1 + n2 <= 18 (2M)

The A758 has been configured at the factory with 512K, 1M or 2M of Flash memory. If n1 + n2 is greater than the maximum number of sectors available, the command is ignored. Reissuing this command with different parameters will erase all sectors.

**Exception:**

This is command is available only in A758 Native Mode

### Erase User Flash Sector

**ASCII:**           GS @ *n*
**Hexadecimal:**   1D 40 *n*
**Decimal:**        29 64 *n*

**Value of *n*:**     49 - 50

Erases a page of Flash Memory and sends a carriage return when the operation is complete.

*n* = 49 (ASCII *n* = 1)
This command erases all sectors available for user-defined characters and multiple logos. The page should be erased in two situations: when the logo definition area is full and an application is attempting to define new logos, and when an application wants to replace one user-defined character set with another. In both cases, all logos and character set definitions are erased and must be redefined.

*n* = 50 (ASCII *n* = 2)
This command erases all sectors available for user data storage.

**Important:**
While erasing Flash Memory, the printer disables all interrupts, including communications. To provide feedback to the application, the printer responds to the application when the erase is complete. After sending the Erase User Flash Sector (1D 40 *n*) command, an application should wait for the response from the printer before sending data. Otherwise, data will be lost. If an application is unable to receive data, it should wait a minimum of five seconds after sending the Erase User Flash Sector (1D 40 *n*) command before sending data.

# Flash Download Commands

These commands are used to load firmware into the printer.

The commands are listed in numerical order according to their hexadecimal codes. Each command is described and the hexadecimal, decimal, and ASCII codes are listed.

There are three ways to enter the Download Mode.

1.  Powering the printer up with DIP Switch 1 up.

2.  While the printer is running normally, use the command Switch to Flash Download Mode, to leave normal operation and enter the Download Mode.

3.  If the Flash if found corrupted during Level 0 diagnostics the Download Mode is automatically entered after the printer has reset.

The printer never goes directly from the Download Mode to normal printer operation. To return to normal printer operation either the operator must turn the power off and then on to reboot or the application must send a command to cancel Download Mode and reboot.

## Switch to Flash Download Mode

**ASCII:**          ESC [ }
**Hexadecimal:**    1B 5B 7D
**Decimal:**        27 91 125

Puts the printer in Flash Download Mode in preparation to receive commands controlling the downloading of objects into Flash Memory. When this command is received, the printer leaves normal operation and can no longer print transactions until the Reboot the Printer command (1D FF) is received or the printer is rebooted.

This command does not affect the current communication parameters. Once the printer is in Flash Download Mode, this command is no longer available.

## Request Printer ID

**ASCII:**          GS NUL
**Hexadecimal:**    1D 00
**Decimal:**        29 0

Returns ACK (06 hex) + 12 bytes ASCII string describing the Flash Memory Boot Sector Firmware part number. Ex : 189-1234567A

### Return Segment Number Status of Flash Memory

**ASCII**:        GS SOH
**Hexadecimal**:  1D 01
**Decimal:**      29 1

Returns the size of the Flash used. There may be 8, 16, or 32 sectors (64K each) in Flash Memory. This command assures that the firmware to be downloaded is the appropriate size for Flash Memory. The value returned is the maximum sector number that can be accepted by the Select Sector to Download (1D 02 *n*) command.

**Exceptions:**

Available only in Download Mode.

### Select Flash Memory Sector to Download

**ASCII**:        GS STX *n*
**Hexadecimal**:  1D 02 *n*
**Decimal:**      29 2 *n*

**Value of *n*:**   the Flash sector to which the next download operation applies

**Range of *n*:**   0 – 7 (512K)
                    0 – 15 (1 mB)
                    0 – 31 (2 mB)

Selects the Flash sector (nn) for which the next download operation applies. The values of the possible sector are restricted, depending upon the Flash part type. The printer transmits an ACK if the sector number is acceptable or an NAK if the sector number is not acceptable. Sector numbers start at 0.

**Exceptions:**

Available only in Download Mode.

### Get Firmware CRC

**ASCII**:        GS ACK
**Hexadecimal**:  1D 06
**Decimal:**      29 6

Causes the printer to calculate the CRC for the currently selected sector and transmits the result. This is performed normally after downloading a sector to verify that the downloaded firmware is correct. The printer also calculates the CRC for each sector during power up and halts the program if any sector is erroneous.

The printer transmits ACK if the calculated CRC is correct for the selected sector; NAK if the CRC is incorrect or if no sector is selected.

### Return Microprocessor CRC

**ASCII**:          GS BEL
**Hexadecimal**:  1D 07
**Decimal:**       29 7

Returns the CRC calculated over the boot sector code space.

**Formulas:**

ACK <low byte> <high byte>

### Erase the Flash Memory

**ASCII**:          GS SO
**Hexadecimal**:  1D 0E
**Decimal:**       29 14

Causes the entire Flash Memory (except the boot) to be erased.
The printer returns ACK if the command is successful; NAK if it is unsuccessful.

**Exceptions:**

Available only in Download Mode.

### Return Main Program Flash CRC

**ASCII**:          GS SI
**Hexadecimal**:  1D 0F
**Decimal:**       29 15

Returns the CRC calculated over the Flash firmware code space. The format of
the response is ACK <low byte> <high byte>.

### Erase Selected Flash Sector

**ASCII**:          GS DLE *n*
**Hexadecimal**:  1D 10 *n*
**Decimal:**       29 16 *n*

**Value and Range of *n*:**

$$0 - 7 = \text{ 512K bytes Flash}$$
$$0 - 15 = \text{1M bytes Flash}$$
$$0 - 31 = \text{2M bytes Flash}$$

Erases the previously selected sector. The printer transmits ACK when the sector
has been erased. If the previous sector is not successfully erased, or if no sector
was selected, the printer transmits NAK.

**Exceptions:**

Available only in Download Mode.

### Download to Active Flash Sector

**ASCII**:            GS DC1 *al ah cl ch d1…dn*
**Hexadecimal**:   1D 11 *al ah cl ch d1…dn*
**Decimal:**        29 17 *al ah cl ch d1…dn*

**Value of *al***      = low byte of the address
**Value of *ah***      = high byte of the address
**Value of *cl***      = low byte of the count
**Value of *ch***      = high byte of the count
**Value of *d***       = data bytes, from 1 to *n*

Contains a start address (ah * 256 + al) and count (ch * 256 + cl) of binary bytes to load into the selected sector, followed by that many bytes. The start address is relative to the start of the sector. Addresses run from 0 to 64K.

The printer may return one of several responses. ACK means that the data was written correctly and the host should transmit the next block. NAK means that, for some reason, the data was not written correctly. This could mean that communications failed or that the write to Flash failed. The alternatives seem to be to retry the block or halt loading and assume a hardware failure.

| Value of *n* (for number of data bytes) | Range of Address (*al ah*) | Range of Count (*cl ch*) |
| --- | --- | --- |
| ((ch * 256) + cl) | 2000-FFFF (hexadecimal) | 0001-0400 (hexadecimal) |

**Range:** Addresses run from 0 to 64K.

**Related Information:**

Available only in Download Mode.

### Reboot the Printer

**ASCII**:            GS (SPACE)
**Hexadecimal**:   1D FF
**Decimal:**        29 255

Ends the load process and reboots the printer. Before executing this command, the printer should have firmware loaded and external switches set to the runtime settings. Application software for downloading should prompt the user to set the external switches and confirm before sending this command. If the downloading was started from a diagnostic, the reboot will cause the printer to reenter download state unless the external switches are changed.

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